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THE ECONOMIC EVOLUTION OF AGRICULTURE

STATEMENTS

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LETTER OF TRANSMITTAL

DECEMBER 3, 1984.

To the Members of the Joint Economic Committee:

The Joint Economic Committee scheduled a hearing entitled "The Economic Evolution of Agriculture" for October 3, 1984, beginning at 10 a.m. The meeting was cancelled shortly before that hour because the Senate had remained in session through the night previous and had adjourned at 9:38 a.m. Consequently, no Senator was available to chair the hearing. This committee print is a compilation of the opening statements of the chairman, Senator Roger W. Jepsen, and the chairman of the Subcommittee on Agriculture and Transportation, Senator James Abdnor, and the prepared statements of the witnesses, John G. Keane of the Census Bureau; William G. Lesher, accompanied by Wayne Rasmussen and David Harrington of the Department of Agriculture; and Ronald C. Wimberly of North Carolina State University. A summary of statistics from the 1982 Census of Agriculture, prepared by the Joint Economic Committee staff has been attached as an appendix to this committee print.

The statements expressed herein are those of the participants and not necessarily those of the Joint Economic Committee.

Sincerely,

ROGER W. JEPSEN,
Chairman, Joint Economic Committee.

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OPENING STATEMENT OF SENATOR ROGER W. JEPSEN, CHAIRMAN

Today we have assembled a panel of four distinguished and knowledgeable witnesses to discuss the economic and structural changes taking place in the farm sector and to examine the public policy implications of these changes. It is a pleasure to have you gentlemen before the committee and we welcome you.

Our hearing title—"The Economic Evolution of Agriculture"—capsulizes three years of intensive investigation and evaluation of the farm sector. Indeed, we are witnessing a transformation in agriculture which is challenging its economic foundation and structure.

The challenges facing agricultural policymakers are many, also. First, technology is the engine for economic change. No industry has outpaced the technical advances and productivity gains made by the farm sector in all of U.S. history. Technology alters markets, production processes and manpower requirements and thereby alters the very structure of an industry. Agriculture is no exception to this.

Second, agriculture has been ushered into the "major leagues" after decades of being relegated to lower status following the industrial revolution. Just a few years ago, the farm sector was limited to a domestic market and was insulated from the economic factors facing other U.S. industries. Nowadays, U.S. agriculture is the dominant force in the international marketplace and makes a $25 billion, positive contribution to our balance of payments annually. But the farm sector is competing in a fierce international marketplace and we have lost ground in the past few years. This lost ground can be attributed to economic influences outside of agriculture—such as the increasing value of the dollar, higher interest rates, higher production costs due to inflation, the use or embargo of food sales as an instrument of foreign policy, or unfair trading practices of our foreign competitors in the world market.

There are farm leaders and public servants who would prefer to be defeatist and defensive of those two big challenges confronting the agricultural economy. But not me. They are opportunities. Technology is an answer, not a problem. America is the economic powerhouse it is because we became more proficient in providing food. As farmers became more productive and efficient, labor and capital resources were freed for use in other economic activities. I assert that the industrial revolution wouldn't have taken place unless it occurred in agriculture first.

With regard to world trade, the only way economic growth can occur in agriculture is to strengthen our competitive edge and to expand our export efforts. Through these efforts, the United States would improve its balance of payments problems and create jobs and opportunities here at home. And the whole world would benefit by consuming food produced at the lowest cost anywhere.

Today, our hearing will focus on how the structure of the farm sector is being affected by these economic changes transpiring in agriculture. Our witnesses today will provide us with invaluable information on farm statistics and the current condition of U.S. agriculture; will share with us their interpretation of the social, economic, and historical implications of these changes; and will give us insights into what the future holds for farmers and the farm sector.

We members of the Joint Economic Committee and Members of the Congress will gain from the insights you give us today. Your contribution to the farm policymaking process is greatly appreciated. Again, welcome to our hearing this morning.

OPENING STATEMENT OF SENATOR JAMES ABDNOR

On behalf of myself and the committee, I welcome our panelists today to discuss what perhaps is the most fundamental question about the future of agriculture: How are farmers, farms and the entire farm sector going to be affected by the social, economic and technical changes confronting the industry? And what are the appropriate response and actions of policymakers as we witness these changes? It is my hope and expectation that today we can elaborate on this challenging and important subject.

Agriculture is becoming evermore diverse and specialized; yet at the same time, more and more farms are far removed from the mainstream of production agriculture. Although you gentlemen are the experts on farm numbers, I would like to share a few with you for the purposes of illustration.

Farms with sales of less than $10,000 annually account for 49 percent of all farms, 16 percent of all farm land, but just 3 percent of sales. The average size farm in this classification is 141 acres; average annual sales are just $3,511. Farms with sales of more than $10,000 annually comprise 51 percent of all farms, 84 percent of the land and 97 percent of all sales. From an average of 708 acres, $111,926 of sales is generated annually on average.

This stark comparison is startling. I guess it is safe to say that agricultural operations come in all shapes, styles, and sizes. I would even go so far as to say that some farmers are in it for reasons other than tilling the soil and trying to make a profit. How can we develop a satisfactory public policy for agriculture facing such diversity? I am confident that we can defend an active role and define an appropriate role for Government in the farm sector. After all, our food and fiber supply is integral to our security and survival.

Economic forces shape all industries, and agriculture has been hit hard by many factors as the chairman has mentioned. And technology is among the strongest forces. I wish to paraphrase the excellent testimony of Mike Phillips from the Office of Technology Assessment, who appeared before our committee yesterday. He said that the adoption of emerging technologies raises important structural questions. Who will adopt these technologies—small, medium or large farms? If technical advances lead to surpluses, then some farms likely will not survive. Which farms will go out of production? Mr. Phillips suggested that large farms are more likely to use new technology which results in lower unit costs, which in turn puts smaller farms at a greater competitive disadvantage. With the adoption of new technology, the whole Nation benefits from lower costs, but it does so at the expense of losing the farms which do not or cannot adapt to new conditions.

Our witnesses here today can make an outstanding contribution to the American public by sharing their analyses of agricultural statistics and their insights on dealing with the accompanying policy issues. Sound public policy is built on a solid understanding of the nature of an industry and the needs of the Nation. Your testimony today will provide us with an excellent foundation on which we can begin to construct the 1985 farm bill.

STATEMENT OF JOHN G. KEANE, DIRECTOR, BUREAU OF THE CENSUS

INTRODUCTION

I am pleased to appear before the Joint Economic Committee to talk with you about results from the 1982 Census of Agriculture. I will highlight some of the changes we have observed in agriculture. Additional detail and information on the history and uses of census data are included in the appendices of my report.

Our review of final data from the 1982 census shows some interesting changes and continued trends in agriculture. I want to point out that since 1974, for census purposes, a farm has been defined as any place that produced or normally produces $1,000 of agricultural products during the census year. Although different definitions were used for earlier censuses, the comparisons I will make with 1969 and earlier census data are not affected significantly by the definition changes.

STRUCTURAL CHANGES IN AGRICULTURE

Final results from the 1982 Census of Agriculture show a continuing 4-decade trend toward fewer and larger farms. There was an increase in the number of small farms but a continued decrease in the number of mid-sized farms. This caused a net decrease in farm numbers nationally. The 1982 census shows a total farm count of 2.2 million. The decline in the farm numbers was 0.7 percent between 1978 and 1982 compared to decreases of 2.4 percent from 1974 to 1978 and 15.2 percent from 1969 to 1974.

The trend toward more large farms continued. Farms with 2,000 acres or more increased by 2 percent and those with 1,000 to 1,999 remained almost constant. The number of farms in the 50 to 499 acre size ranges decreased, while farms 1 to 49 acres increased (Chart 1).

The relative stability in farm counts was not uniform across the country. In the Northeast and the South, farm numbers were almost unchanged, but the West recorded an increase of 25,662 farms (10 percent) while the Midwest States experienced a loss of 42,409 farms (4.3 percent).

There was a 28 million acre reduction in farmland for 1982. This resumed a trend toward substantially reduced farm acreage which had been slowed by a relatively small 2.3 million acre loss in the 1978 census. The 1974 and 1969 censuses recorded decreases of 45.9 and 47.3 million acres, respectively. Approximately 30 percent of the 1982 decrease was cropland, 17 percent was woodland, and 53 percent was pastureland. The loss of land in farms was 2.8 percent and was fairly uniform nationwide, varying from 2.3. percent in the Midwest to 3.7 percent in the South.

Harvested cropland data provide solid evidence of the overall trend toward larger production units. Farms harvesting 2,000 acres or more increased 32 percent and those with 1,000 to 1,999 acres rose by 24 percent. There was a slight decrease in harvested cropland on farms with fewer than 50 acres, but the largest absolute and percentage declines were recorded in the 50 to 199 acre group where a 12 percent drop occurred. Even those in the 200 to 499 range, which had registered a slight increase in numbers in 1978, suffered an 8 percent decrease in 1982 cropland. The shift toward larger acreages of harvested cropland was particularly strong in the grain-producing Midwest States, where farms with 2,000 or more acres harvested rose a sharp 52 percent with correspondingly large decreases in the mid-sized groups below 500 acres.

Part of the growth in the larger acreage farms is attributable to a 3 percent growth from 1978 to 1982 in the total amount of cropland harvested, but it does not explain the disappearance of the mid-sized farms. Most of the shift was the result of continued consolidation into larger farms.

A similar pattern emerges from farm product sales data. Farms with sales of $500,000 or more made up 1.2 percent of all farms but they accounted for almost one-third of the value of products sold. At the other extreme, almost one-half of all farms had sales of less than $10,000, but their share of total sales was less than 3 percent. Mid-sized farms with sales of $10,000 to $99,999 decreased by 13 percent, and their proportion of farm sales dropped from 33.4 percent in 1978 to 24.7 percent in 1982. Even when inflation is taken into account, it is evident that considerable production concentration is continuing (Chart 2).

Total irrigated land dropped from 50.3 to 49.0 million acres between 1978 and 1982, reversing a strong expansion or irrigated land in recent censuses. Texas experienced a loss of more than a million acres in irrigated cropland harvested; but substantial increases in Nebraska, Arkansas, and other States resulted in a net increase of 1.7 percent irrigated harvested cropland. The big decline came in irrigated pastureland, especially in the West where a decrease from 4.9 million to 3.8 million acres occurred. Increased cost for energy to pump water from falling water tables was a major reason for the decrease in the Texas Panhandle and other parts of the High Plains.

Increased farm size and production concentration do not appear to be altering the basic family farm dominance of American agriculture. Eighty-nine percent of all farms are controlled and operated by individuals or families. They operated 81 percent of the land, 83 percent of the harvested cropland, and received 77 percent of the value of farm products sold. Partnerships, many of which are family partnerships although they are not separately identified as such in the census, accounted for 10 percent of the farms and 16 percent of farmland, harvested cropland, and value of sales. Nonfamily corporations had 0.3 percent of the farms, 2 percent of the land in farms, 1 percent of harvested cropland, and 6.5 percent of the value of sales.

Family farms have lower average sales than nonfamily corporations and partnerships. Although their proportion of total farms decreased as size of sales increased, they accounted for more than

70 percent of even the largest sales class ($500,000 or more). Corporate farms increased by 19 percent from 1978 to 1982; but 88 percent of all corporations were family corporations, and 97 percent of these had 10 or fewer shareholders. The largest increase in corporate farms (34 percent) occurred in the Midwest Region where consolidation of farms also appears to be taking place. The Northeast, South and West registered corporate farm increases of 11, 6, and 18 percent, respectively. The trend that emerges is the growth and incorporation of family farms rather than an intrusion of nonfamily corporations into agriculture.

Since 1978, the classification of farm operators by tenure shows slight increases in the percentages of full owners and part owners and a decrease in tenant farms. Part-owner farms which operate both owned and rented land are, on average, much larger than full-owner and tenant farms. Twenty-nine percent of the farms, accounting for 54 percent of the farmland, are classified as part-owner operations. Part owners make up 64 percent of the farms with 2,000 acres or more. The dominance of part-owner farms in the large acre categories implies that farm growth and full use of inputs such as labor and machinery are accomplished most frequently through a combination of land ownership and renting land from others.

The percentage of full-owner farms with fewer than 50 acres increased from 77 to 79 percent between 1978 and 1982, providing evidence that most of the new shall farms are fully owned.

CROPS

Four major crops, corn for grain, wheat, soybeans, and hay crops, accounted for 80 percent of all the crop acreage harvested and 60 percent of the value produced in 1982.

Corn

The acreage of corn for grain shot upward by one-third since 1969 from 52 million acres to 70 million in 1978, but there was no change between 1978 and 1982. Per acre yields have increased by 25 bushels since 1969, from 85 bushels per acre to over 105 bushels in 1982. The number of farms producing corn has decreased steadily since 1969 from 986,000 to 715,000 in 1982, a decline of 30 percent.

However, farms growing 500 or more acres of grain corn have increased by over four times since 1969. In 1982, there were 17,400 farms with 500 or more acres of corn, 2.4 percent of the total corn farms. These farms accounted for 20 percent of the acreage and production.

Wheat

Reversing a long-term decline, data from the 1982 Census of Agriculture show a significant increase in the number of farms producing wheat. There were 446,000 farms that harvested wheat in 1982, up from the 379,000 farms that reported wheat in the previous census. The corresponding rise in wheat acreage and production was substantial. Wheat acres harvested increased 31 percent from 1978 to a total of 71 million acres in 1982, while production jumped 47 percent to almost 2.4 billion bushels.

Though the increase in wheat production was evident in almost every State, nowhere was it more dramatic than in the South. In 1978, the southern portion of the U.S. accounted for less than 4 percent of the Nation's wheat harvested. By 1982, over 11 percent of the wheat harvested was produced in the South. Not surprisingly, almost two-thirds of the Nation's overall increase in wheat-producing farms were located in the South.

Cotton

Farms with cotton accounted for 2 percent of the farms in the United States. While the cotton crop accounted for only 3 percent of the harvested land and 2 percent of the total value of agricultural products sold, it accounted for 5 percent of the value of crops sold. There were 38,000 farms with 9.8 million acres of cotton in 1982. These farms produced a total of 11.3 million bales of cotton which sold for $3.2 billion.

Nowhere has the shift from numerous and small farms, to fewer and larger farms been more pronounced than in cotton farming. In 1964, the average cotton acreage was 43 per farm. By 1982, this average had increased nearly six times to 256 acres. It appears that this consolidation is still taking place at a diminishing rate. In 1978, the average acreage was 237, 7 percent less than 1982.

In terms of cotton farm numbers, there has been a dramatic decline. Since 1964, farms producing cotton have declined 88 percent from 324,000 farms to 38,000 farms in 1982. Even as recently as 1978, the farm count stood at 53,000, giving a 27 percent reduction in farms between 1978 and 1982.

While variable between censuses, it appears that California, Arizona, and Texas are increasing in cotton acres as the Southern States are tapering off. In 1964, the Southern States held 42 percent, Texas held 41 percent, and the West held 8 percent of the 13.9 million acres of cotton. In 1982, the Southern States dropped to 31 percent while Texas and the Western States had picked up to 43 percent and 11 percent, respectively.

Soybeans

Soybean acreage has shown a strong rise for many years. In 1969, there were 38.5 million acres. By 1982, the acres had risen 41 percent to 64.8 million. Soybean acres accounted for only 7 percent of the harvested cropland in 1969. By 1982, the soybean share of harvested acres had increased to 20 percent. Farms harvesting soybeans decreased 4 percent from 530,000 to 511,000 in 1982.

Hay

Hay has been an important staple of the agriculture sector. In 1982, 1.1 million farms harvested 128.5 tons of hay from 59.7 million acres. The value of production was estimated at $8 billion. Hay accounted for 18 percent of all harvested cropland and 11 percent of the estimated value of production of all crops. While hay has not changed as dramatically as many other crops, it has shared, to some extent, the decreasing farm count and increasing acres.

LIVESTOCK

Cattle and calves

The livestock sector also is showing some significant changes. Reflecting cyclical trends, cattle and calf sales were down from 1978 as seen in Chart 3. Mid-sized farms showed the largest decrease in cattle sold. There were 24,000 more farms with fewer than 20 cattle and calves sold, but the sales from these farms decreased. Similarly, sales for cattle fattened on grain or concentrates were down 7 percent in number. The greatest decreases in both farm count and number sold occurred in the 20 to 499 head range, accounting for 49 percent of the total decrease in number sold.

Concentration is at work in terms of livestock inventories. For example, cattle and calf operations with inventories of less than 50 head were 64 percent of the total farms but only 16 percent of the inventories. Those with 500 head or more were only 2 percent of the farms but held 29 percent of the inventory.

Hogs and pigs

While cattle sales were down, sales of hogs and pigs were up, representing 8 percent of agricultural product sold for 1982. Sales show a greater concentration when compared to 1978, with 26 percent fewer farms selling 5 percent more swine. The number of farms selling fewer than 500 head annually decreasd about 30 percent; number of sales were down by a similar amount. Farms selling 1,000 head or more increased by 38 percent. The number they sold increased by 47 percent to 45.6 million head (Chart 4.) This latter group of 22,000 farms, now accounts for 48 percent of total number of hogs and pigs sold in the United States. About 95 million hogs and pigs were sold in 1982 with Iowa ranking first in number sold with 24 million.

Milk cows

The dairy industry also showed some major changes. The number of farms with milk cows was down 11 percent from 1978 to 277,700 farms in 1982, but the total inventory of 10,850,000 cows reflected a 6 percent increase (Chart 5). The largest inventory increase for 1982 was 27 percent on farms with 500 or more head, mainly in the West. The greatest percent decrease occurred on farms with 1 to 19 head for both farms and cows. This trend reflects movement away from the family herd toward the more commercial and larger herds which are more efficient, particularly in the Midwest and West Regions of the United States.

Milk sales represented 12 percent of total value of agricultural products sold in 1982. Milk production in the United States is concentrated largely in the Northeast and Great Lakes States and in California. These 16 States accounted for 58 percent of the total value of dairy products sold in 1982.

Hens and pullets

Layer inventory on poultry farms shows an increase from 1978 to 1982 of 3.4 percent. Total inventory of approximately 311 million is concentrated mainly in the South with 133.4 million or 43 percent. The number of farms is down, as well as are the inventories for all farms except those with 20,000 or more. In this group, there were approximately 2 percent of total farms that accounted for 79 percent of all inventories (Chart 6). The value of eggs and poultry sold represented 3 percent of all agricultural products sold.

ECONOMIC PROFILE

The value of all farm products sold increased 23 percent between 1978 and 1982. During this period, the consumer price index showed a 35 percent increase in food costs. Crop sales made up 47 percent of the total value compared to 45 percent in 1978. Livestock and poultry's share of the total dropped from 55 to 53 percent. All major crop categories showed value of sales increases, with cash grain up the most with an increase of 36 percent and cotton the least with a 4 percent gain.

All major livestock categories except sheep and lambs also recorded sales increases. Dairy products and hogs showed the greatest increases in concentration of sales. Dairy product sales were up 45 percent even though there were 8 percent fewer farms selling these products. There was a 26 percent decrease in farms selling hogs and a 22 percent increase in the value of hog sales.

The distribution of farms by Standard Industrial Classification (SIC) reflected the trend toward concentration. The SIC is determined by the commodity from which 50 percent or more of a farm's sales are derived. The percentage of cash grain farms, especially wheat and corn farms, has increased; and this growth is concentrated on farms with sales of $100,000 or more. Field crop farms (excluding cash grains and vegetables), reflecting the decline in cotton and hay farms, decreased substantially with the biggest decline appearing among farms with sales of less than $10,000.

Comparisons of selected expenditures to total sales also demonstrate the greater efficiency of larger farms. Farms with sales of $100,000 or more accounted for more than 70 percent of product sales in 1982. Credit costs on these farms amounted to almost two-thirds of interest expenses for all farms, and their energy costs made up 57 percent of the total for all farms. The greater return they received per dollar borrowed or spent is shown by the fact that they spent only 13.7 cents for interest and energy products per dollar of sales. This compares to expenditures of 38.6 cents for these items by farms with sales of less than $10,000.

Hired labor costs increased $1.6 billion from 1978 to 1984. Since 1974, however, hired labor costs have remained almost constant at 6 percent of gross sales, dropping from a high of 11 percent in 1944 (Chart 7). The modest increase in hired labor costs from 1978 to 1982 may reflect the use of tax benefits of incorporating and paying hired family members for their labor rather than reporting the money as farm income.

The increased fertilizer and chemical use during the 1970's has evolved into selective application in the 1980's. While the cost of fertilizer used per acre doubled from 1969 to 1974, the cost per acre increased only 25 percent from 1974 to 1982.

The increased acreage treated with chemicals for weeds, brush, insects, or nematodes control during the 70's has leveled out. The cost of chemicals increased from 2.7 percent of sales in 1978 to 3.3 percent of sales in 1982 indicating that cost appears to have dampened expended use (Chart 8). Although total acres treated with chemicals or fertilizers have stabilized, the selective use is changing the expenditure patterns on farms. From 1978 to 1982, chemical cost rose from 4.9 to 6.1 percent of sales on cash grain farms. Cost of fertilizer used dropped from 8.3 to 6.8 percent of sales on tobacco farms. As pricing patterns change and the implementation of cropping practices such as minimum tillage or no-till expand, the use of chemicals and fertilizer may change.

Physical resources

As farms grew in size and the pressures and opportunities of production concentration continued, the dollar value of farmland, buildings, machinery, and equipment also has grown. It nearly doubled between 1974 and 1982, while the money received by our Nation's farmers for the commodities they produced has increased by only 1.6 times. This inability of farm prices to keep pace with input costs would have been further aggravated had total output from a standpoint of actual production (quantity harvested, broilers slaughtered, and so forth) not increased.

It appears that farmers with sales of $10,000 to $39,999 would be most hard-pressed by any downturn in farm prices or upturn in interest rates. They are involved heavily in agriculture, yet they are not large enough to derive the economies of scale benefiting larger operators. Although 65 percent of operators with sales of $10,000 to $39,999 reported farming as their principal occupation in 1982, they generated less than 10 cents of farm sales of every dollar of land and buildings they controlled. This compares to 46 cents for farmers with annual sales of $500,000 or more. These mid-sized operators produce just under 50 cents of sales for every dollar of machinery and equipment they control, compared to farmers with annual sales of $500,000 or more who produce $5.47 of sales for every dollar of machinery and equipment.

Although the numbers of most machinery and equipment items showed little change from 1978 to 1982, the reported value of farm machinery increased by $16 billion (21 percent) during this period. Most of the increase in value probably can be attributed to higher costs of new and used machinery. The percentage of machinery that was less than 5 years old in 1982 was considerably lower than in 1978. So it seems that the high cost of replacement was keeping the value of older equipment high and perhaps causing some of it to appreciate in value.

In 1982, 16 percent of the tractors were less than 5 years old compared to 18 percent in 1978. Recently, manufactured farm trucks declined from 38 percent to 31 percent of the total. Similar drops from 25 to 21 percent and 26 to 23 percent occurred for combines and balers, respectively. The reluctance to make costly investments in new machinery was an indication of the effects of the cost-price squeeze and seemed to be even more prevalent on farms with more pieces of equipment than on the others.

DEMOGRAPHIC TRENDS

Occupation and age

Occupation and age provide valuable insights about the make-up of farmers and their involvement in agriculture as a livelihood and a way of life (Chart 9). Farming was the principal occupation of 55 percent of all farm operators, and their share of total sales was 87 percent. The 45 percent whose occupation was something other than farming made up the remaining 13 percent.

The proportion of operators with occupations other than farming has increased in each recent census. In 1974, 38 percent had nonfarm occupations; and this increased to 44 percent in 1978 and 45 percent in 1982. This is related to the growth in small farms because the percentage of occupations other than farming increases as the size of farm decreases. Only 11 percent of operators with 1,000 acres or more have nonfarm occupations, while about 70 percent of those with less than 50 acres have occupations other than farming.

The concentration of production among operators with farming occupations is even more evident when age is considered. The average age of all farm operators was 50.5 years, up slightly from 50.3 in 1978 but lower than the 51.7 average age in 1974. In the 35 to 65 age group, operators with farming occupations and those with other occupations each operated about one-third of all farms. Yet those with farming occupations in this age group accounted for two-thirds of total agricultural sales, and those with other occupations accounted for less than 10 percent.

Many operators 65 years or older are retired from nonfarm jobs and report their occupation as farming, but it is apparent that many of their operations are small retirement farms. Among the farming occupation group, 22 percent are 65 or over, but they account for only 10 percent of the value of products sold.

In the under 25 age group engaged primarily in farming, 55 percent are tenants and the average value of sales is low, showing that many are renting from their parents and probably have not left home yet.

Off-farm work

Almost one-fourth of those operators whose principal occupation was farming reported off-farm work. Five percent reported 200 or more days, 5 percent reported 100 to 199 days, and 14 percent reported less than 100 days of off-farm employment. More than 70 percent of farm operators with nonfarming occupations worked 200 days or more off the farm. Twelve percent worked between 100 and 200 days and 5 percent worked less than 100 days at off-farm jobs or businesses.

AGRICULTURE CENSUS DATA QUALITY

The quality of data for the census of agriculture is of major importance and concern at the Bureau. The primary vehicle for measuring agriculture census quality is the coverage evaluation program. A system of periodic quality control checks is used at various stages of processing for ensuring the completeness and consistency of reported data.

Coverage evaluations have been conducted for each agriculture census since 1945 and provide an independent check of the census results. These evaluations indicate that the coverage of small units is a continuing problem. These small units are not likely to be included in any administrative record sources available to the Bureau. Preliminary coverage estimates for the 1982 Census of Agriculture indicate that 30 percent of farms with less than $2,500 in sales were missed, and these farms accounted for less than 2 percent of estimated sales value of agricultural products. Another indication of their size is that 75.6 percent of the missed farms had sales of less than $2,500. Coverage estimates for all farms indicate that 10 percent were missed in the census.

Census of agriculture data users, including the Congress, were critical that the 1969 and 1974 censuses missed 15 percent and 11 percent of the farms, respectively. An area Sample Survey was added to the 1978 Census of Agriculture, and only 3.4 percent of all farms were missed and 6.5 percent of farms with less than $2,500 in sales. The area sample is a coverage improvement survey for national- and State-level estimates and a tool for evaluating county-level estimates.

Farms from the area sample survey for 1978 accounted for 9 percent of all farms in the United States, but only 1 percent of the total value of agricultural products sold and 1 percent of the land in farms. For farms with sales of less than $2,500, the area sample survey contribution was substantially higher and provided about 25 percent of the farms, 6 percent of the land, and 14 percent of the value of sales. The contribution of the area sample survey to the total farm count varied greatly by state, from a low of 2.0 percent in North Dakota to a high of 23.8 percent in New Hampshire. The area sample survey made a relatively high contribution to farm numbers in New England and Southern States. For farms with black or female operators, the contribution of the area sample survey was much larger than for the total farms in 1978. For farms with black operators, the area sample survey provided about 25 percent of the farms, 13 percent of the land, and 9 percent of the sales. For farms with female operators, it contributed 12 percent of the farms, 3 percent of the land, and 2 percent of the sales.

The constant change and complexity of farm units as well as the deficienty in administrative record source lists prevent a more complete coverage for a census with data collection by mail only. Using an area sample survey to supplement the census mail list, as in the 1978 Census of Agriculture, would provide an important means of improving census data completeness. The broadbased reliance on census results by other Federal agencies, Congress, and State and local governments places a strong requirement for an area sample survey to restore the needed quality and coverage to the agriculture census.

SUMMARY OF DATA NEEDS

Another area which is receiving high priority is the needs of data users. The census of agriculture provides structural data on a periodic basis at the national, regional, state, and county levels. However, census data are not intended to provide estimates of current agricultural situations. Rather, they provide information needed to study agricultural economic structure and farm characteristics over a period of time. Economic and technological change dictates changes in data needs. Some of these data needs can be met with the use of sample surveys, using the census as a sampling frame. Since the late 1950's, estimates on various topics have been provided by sample surveys of farms and ranches. For example, the Bureau has conducted surveys on Hired and Family Labor; Debts, Assets, and Off-farm Income; Partnerships; Corporate Farms; Energy Use; and Irrigation Practices.

Data gaps

Despite the Bureau's intensive program of providing data and the programs of other government agencies to do the same, situations arise which present significant policy problems for which no data are available currently to use in analyzing and developing programs to alleviate the problem. Many of our users have expressed concern for the lack of data in the following areas:

Farm finance.—There is mounting concern over the current farm debt situation. The most current detailed farm finance and debt data available are for the year 1979. Users, including the Economic Research Service (ERS) of the U.S. Department of Agriculture (USDA), the Farm Credit Administration, and the Federal Reserve Board have approached the Bureau, seeking a data collection effort which will provide current data on the status of farm finance and debt. However, no funding sources are available to conduct such a survey.

On-farm irrigation.—As part of the 1978 census program, an on-farm irrigation sample survey was conducted to provide users with extensive data concerning farm and ranch irrigation practices. The survey provided information on acres irrigated, yields of irrigated and nonirrigated crops, quantity of water used, method of water distribution, type of pumps, and expenditures for pumping irrigation water.

The survey results are being used extensively by many users, in particular ERS and other agencies within USDA and the Department of the Interior. These users have approached the Bureau in an effort to have the on-farm irrigation survey conducted in the future.

Hired labor.—Several agencies have asked the Bureau for information on farm and migrant labor for various research and outreach programs. The Bureau has not conducted a farm labor survey since 1964.

Energy.—The energy crisis in the mid-1970's generated a need for detailed information related to farm energy use. In response to this need, the Bureau conducted a farm energy survey in 1979. Data users have expressed an interest in developing a continuing data series in the area of energy use.

Input resources.—The Bureau is working with ERS to develop a series of surveys which will provide information on inputs and cultivation practices for major crops. Data would be provided on inputs such as pesticides, herbicides, fertilizer and other agricultural chemicals, as well as cultivation practices. Data collected will be used by both USDA and the Environmental Protection Agency (EPA) for research and evaluation of current programs.

Sample surveys help reduce respondent burden

Using sample surveys reduces both data collection costs and processing and respondent burden. For example, to provide detailed information on farm debt, energy usage, or irrigation would involve response to a large number of questions. This, if added to a general census questionnaire, would prove extremely burdensome. By selecting a stratified sample from the census, respondent burden can be reduced. A sample of 4,000 to 8,000 farms may be sufficient to project accurate national totals for any one of the previously mentioned subjects. The reduced response burden also results in reduced cost for mailing and processing.

CONCLUSION

It has been a pleasure to be here today to talk about this vital statistical program. The census of agriculture data have become the benchmark for agricultural policy analysis of all levels of government. They also are the backbone of many market analyses, research projects, and advertising campaigns conducted by the private sector. Without this 5-year county-level measurement of agriculture, information on our food and fiber system surely would not be as complete. Thank you for asking me to testify.

APPENDIX A.—BACKGROUND AND HISTORY OF THE CENSUS OF AGRICULTURE

BACKGROUND

The census of agriculture program constitutes a comprehensive and periodic canvass of the Nation's agricultural activity, providing the data to chart trends in the farm sector. It is the only source of uniform, comparable agricultural data for each county and state and for the country as a whole.

The census of agriculture was taken every 10 years from 1840 to 1920 and every 5 years from 1925 through 1974. The census has undergone a reference-year change. Two 4-year censuses taken for 1978 and 1982 adjusted the data-reference year to coincide with the economic censuses starting in 1982. Thereafter, the agriculture census will revert to a 5-year cycle.

The agriculture census is authorized by law under Title 13, United States Code, Section 142, which requires that the census be taken at 5-year intervals covering the years ending in "2" and "7". The census law imposes a joint obligation on farm and ranch operators to respond and on the Census Bureau to maintain the confidentiality of information reported to it. The law also specifies penalties for noncompliance and for disclosure of information by the Census Bureau. A farm, for statistical purposes, is any place from which $1,000 or more of agricultural products were sold or normally would have been sold during the census year.

The 1982 Census of Agriculture is substantially similar to the 1978 census. It covers all farms and ranches in the Nation. The census provides data on agricultural land use and ownership, crops, livestock and poultry, value of products sold, irrigated land, direct marketing, type of organization, corporate structure, operator characteristics, fertilizer and chemicals, interest expense, machinery and equipment, energy expenditures and fuel storage capacity, selected production expenses, and market value of land and buildings.

The Census Bureau recognizes the importance of consulting with data users concerning questions to be asked in the census. Just as the agriculture industry changes, so must the content of the agriculture census in order to meet the data users' needs. In planning the census of agriculture, the Census Bureau consults with farmers, ranchers, farm organizations, universities, trade associations, county and state governments, manufacturers of products used by farmers, and other Federal agencies.

The Statistical Reporting Service (SRS), USDA also collects statistical information from agricultural operations. The SRS programs and the census of agriculture programs are viewed as complementary by the Census Bureau and most agriculture data users. There are some areas of duplication; but when the differences are reviewed, the slight overlap is justified. Some justifications are:

> The census is the only source of consistent county-level agriculture data for the Nation.
>
> Acreage, crops harvested, livestock sales, and so forth, are needed to provide information on the structure of agriculture—characteristics of farms by type, size, form of ownership/operation.
>
> Census data are used to benchmark nonprobability surveys of the USDA.

APPENDIX B.—OTHER RELATED STATISTICS/DEVELOPING COUNTY PROFILES

A statistical profile of counties can be developed from the census of agriculture and the Bureau's other censuses and surveys. Detailed demographic and economic information about people and their living quarters is available from the censuses of population and housing, which are conducted every 10 years in years ending in "0." Various series of state reports from these censuses include information for all counties and selected cities. These reports include information on the population and its characteristics such as persons in the household, age, sex, and race. The reports also include data on general social and economic characteristics such as occupation, income, and commuting distance to work. Some reports include data on farm and rural populations. Virtually all of the data appear on computer tapes in greater detail and for smaller geographic areas than in the printed reports. Annual population estimates by county are available from the current surveys program.

The annual series of County Business Patterns reports provide information on the nonfarm sector of the economy at the county level. Because County Business Patterns statistics provide information on establishments, payroll, and employment by industry classifications, they are useful for analyzing the industrial structure of regions and making basic economic studies of small areas. Data for all counties are available on computer tape.

Limited data on the business and industrial activities of rural counties are available from the economic censuses, which are taken every 5 years for years ending in "2" and "7." Generally, only data on total wholesale trade and total retail trade and 10 major retail kinds of businesses are available for rural counties from the censuses of wholesale and retail trade. Normally, no data are available from the census of manufactures for rural counties. Thus, County Business Patterns is the best source for data on the economic structure of rural areas.

Another useful reference source for county-level data is the County and City Data Book. It includes information from the Bureau's censuses and 60 other governmental and private sources in one volume.

APPENDIX C.—AGRICULTURE CENSUS DATA USERS AND USES

The agriculture census is the major source of information about the Nation's agriculture industry. The census of agriculture claims a broad and diversified group of data users. From academia to governments to agribusiness, census data are used daily.

Congress uses census data to draft legislation, review existing laws, and determine trends. Governments use agriculture census data in programs which affect agricultural production. The data are used to administer conservation and commodity programs, develop estimates of farm income and other economic indicators, and to conduct research. State and local governments use the data for economic planning, administering programs, and developing land use policy.

Farmer organizations such as the American Farm Bureau Federation, the National Grange, the National Farmers Organization, and the National Farmers Union use census data to evaluate farm programs, determine membership potential, and develop marketing programs. Agribusiness determines market share, conducts research, and locates distribution and retail facilities based on census information. Many companies and cooperatives determine their market potential using agriculture census data.

Economic and demographic analyses are an important part of good legislation. Adequate information is the key to economic and demographic analyses. The census of agriculture provides that information but not always in the form needed by a data user. The Bureau recognizes this and now offers special tabulations on a cost reimbursable basis. Sometimes users need data in more detail or in a different form than they are published. The Bureau will prepare a cost estimate at no charge and advise users on data quality of the items they are requesting. Through our regular data dissemination program and these special tabulations, the Bureau is striving to serve its data users better.

APPENDIX D.—DATA AVAILABILITY

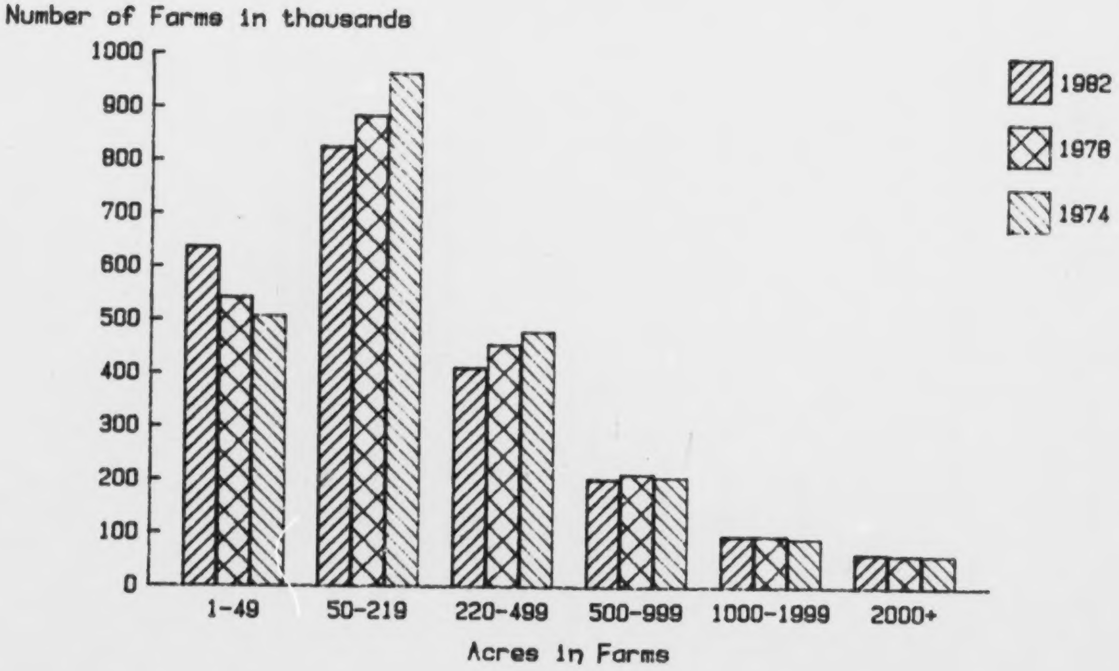
The 1982 Census of Agriculture final data are available in published reports for each state. The state reports contain state-level information and data for each county with 10 or more farms. Before these reports are published, a short preliminary report is issued for each state and county. Both final and preliminary data are available on computer tape, while only preliminary data are available on diskette for personal computers. Again, if published information does not meet the needs of a data user, the Bureau will consider doing a special tabulation on a cost reimbursable basis. These special tabulations can be tailored specifically to the users' needs.

All of the information is available through several sources. First, any of our information can be accessed by contacting the Census Bureau. The data also can be found in the Library of Congress and more than 1,200 Federal Depository Libraries across the country. Another way of obtaining the information is through the State Data Centers. These centers were established in 49 states as a joint effort between the Census Bureau and each state government. This program helps provide easier access to Federal statistical information.

Another way to get census data is through two electronic information services. CENDATA is available through an electronic service called DIALOG. CENDATA provides information from all programs within the Census Bureau. Preliminary data from the agriculture census are available through the AgriData Network.

CHART 1

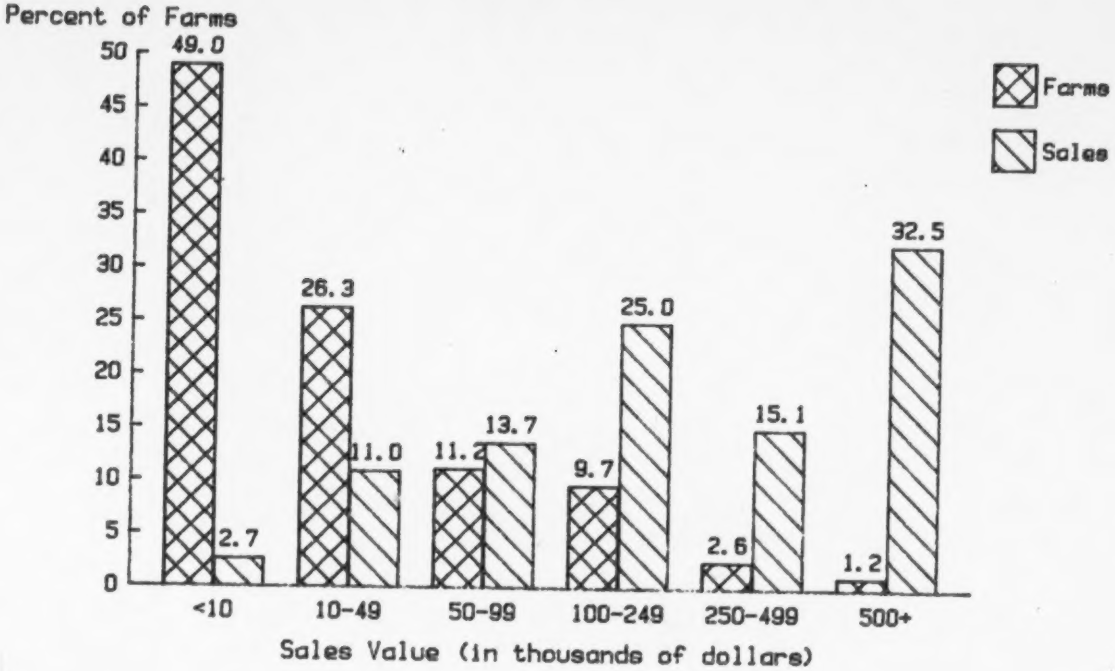
Number of Farms by Size



U.S. Bureau of the Census

CHART 2

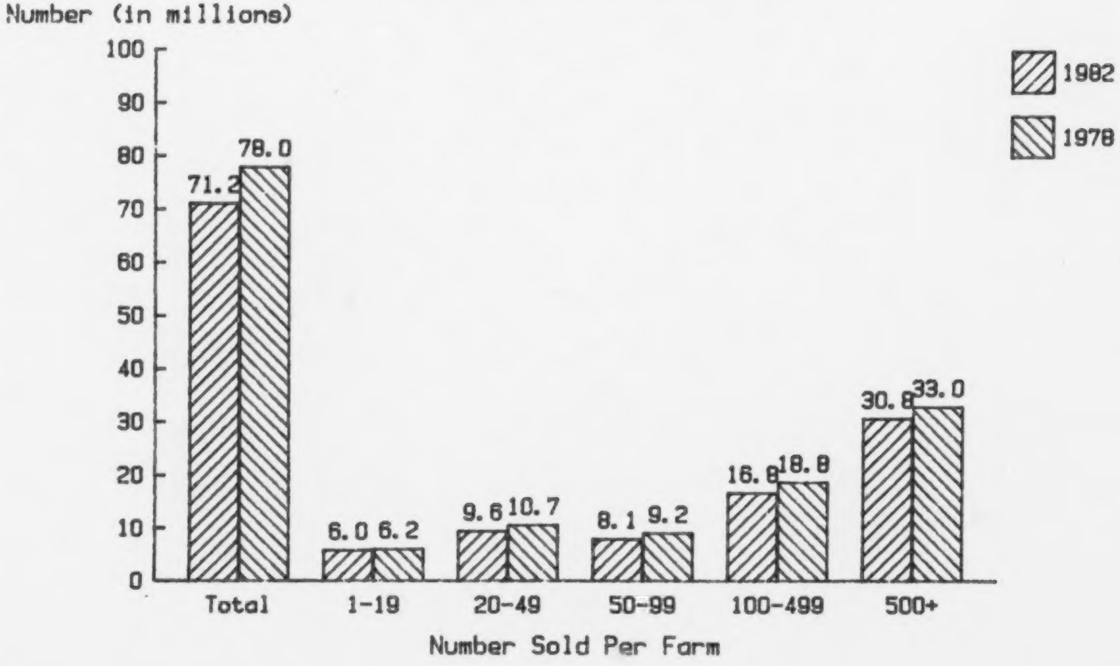
1982 Census of Agriculture
Value of Sales



U.S. Bureau of the Census

CHART 3

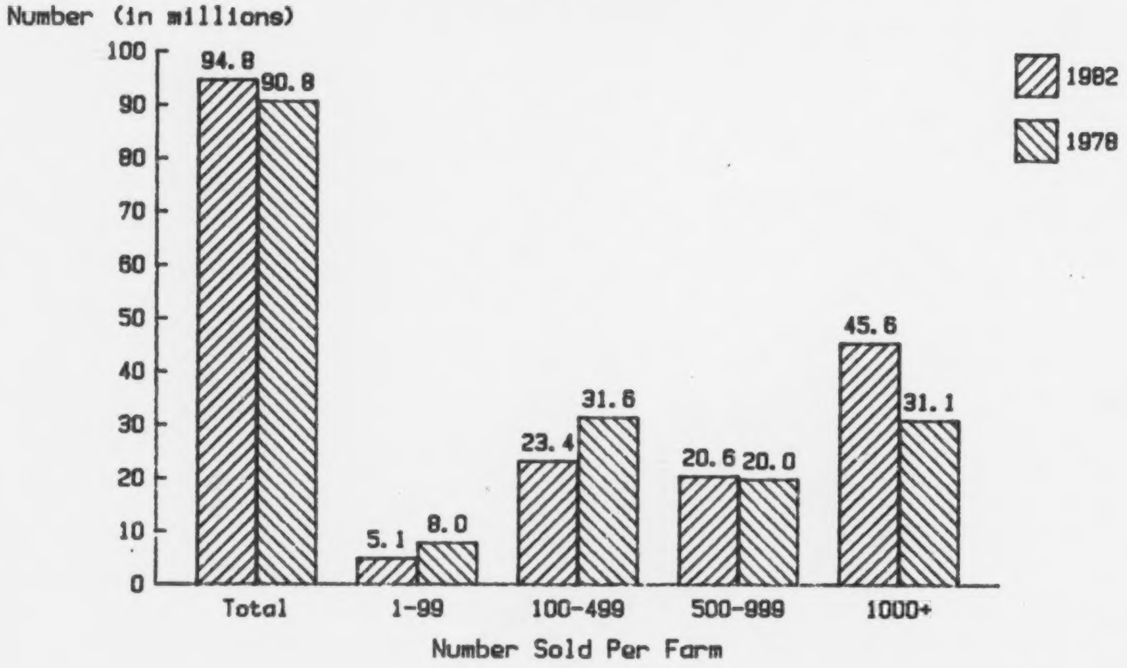
United States
Cattle and Calves Sold:
1982 and 1978



U.S. Bureau of the Census

CHART 4

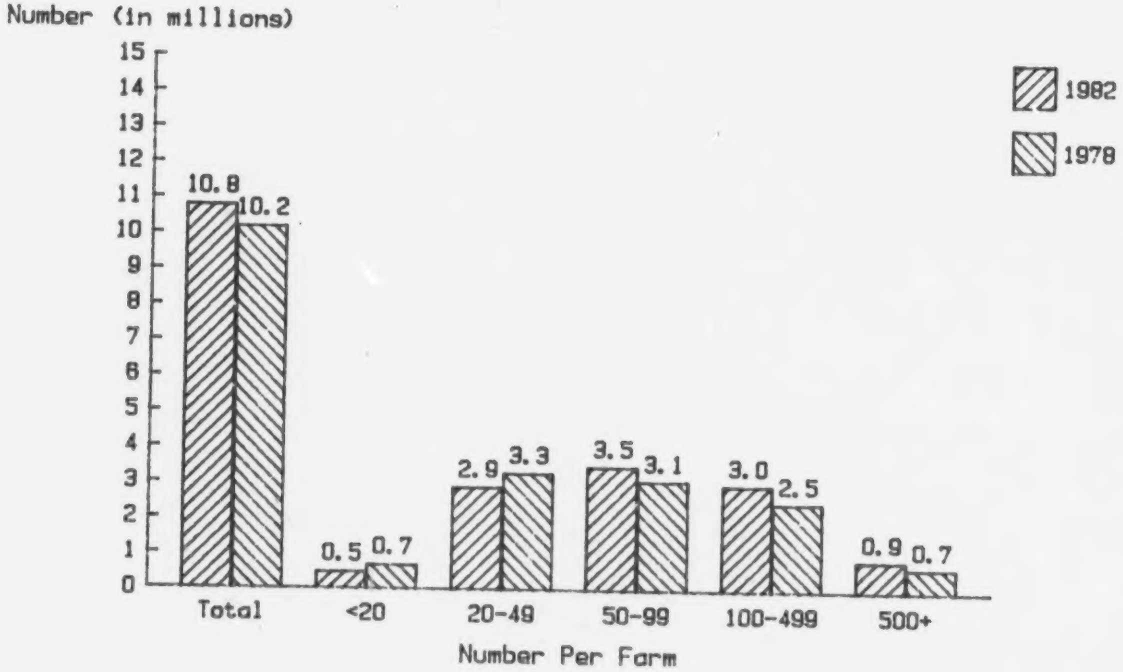
United States
Hogs and Pigs Sold:
1982 and 1978



U.S. Bureau of the Census

CHART 5

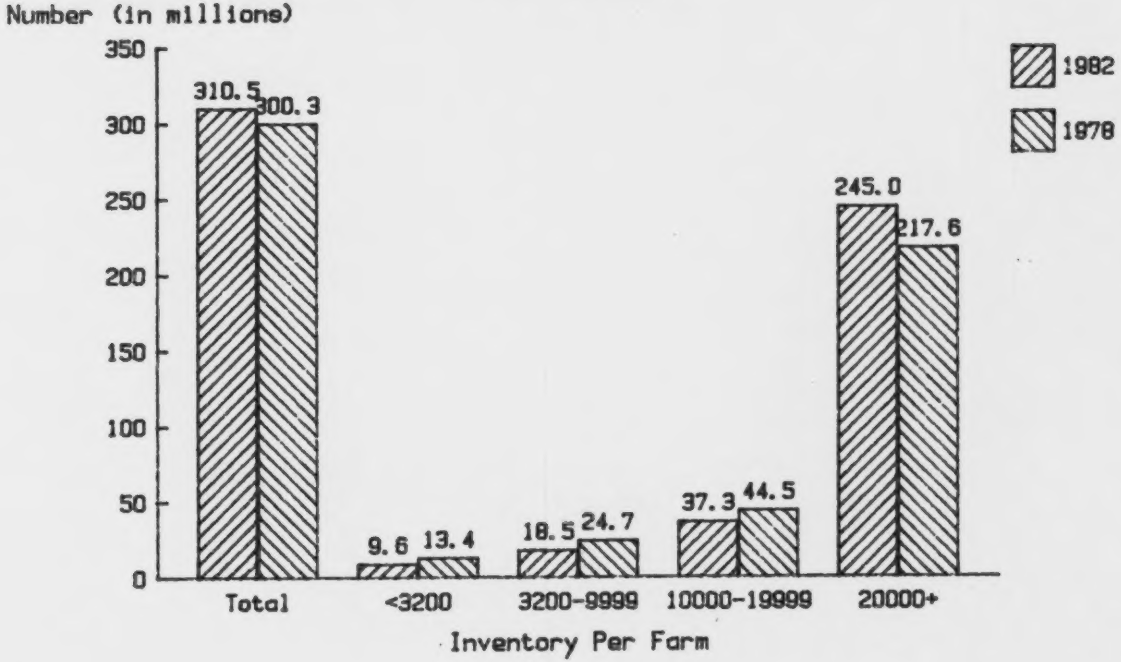
United States
Milk Cows Inventory
1982 and 1978



U.S. Bureau of the Census

CHART 6

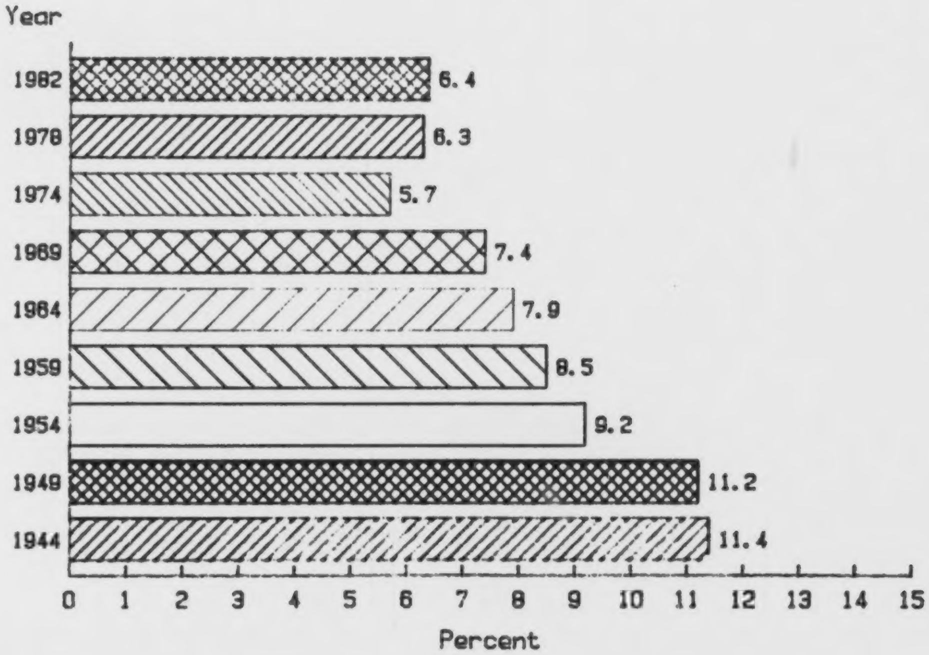
United States
Hens and Pullets of Laying Age Inventory
1982 and 1978



U.S. Bureau of the Census

CHART 7

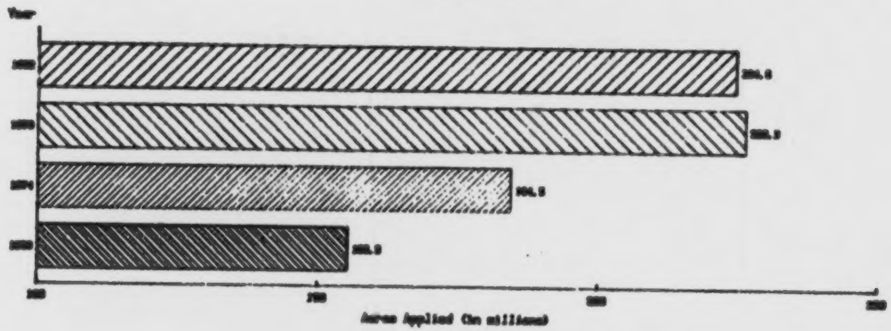
Hired Labor as a percent of gross sales



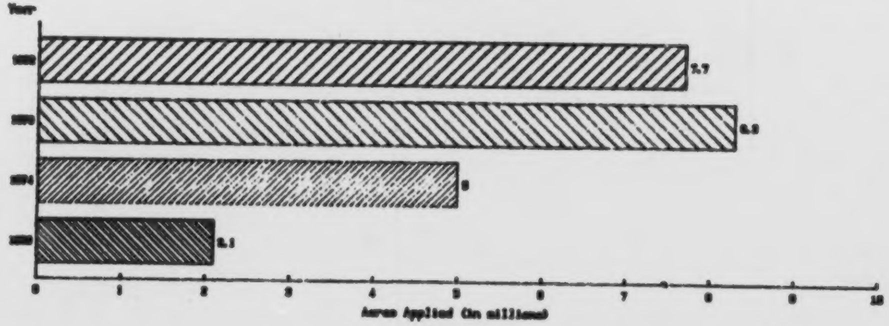
U.S. Bureau of the Census

CHART 8

Fertilizer Applied
1969 - 1982



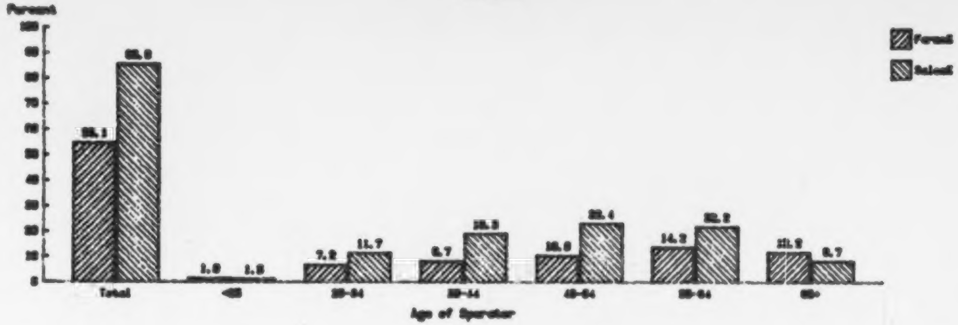
Fertilizer Expenses
1969 - 1982



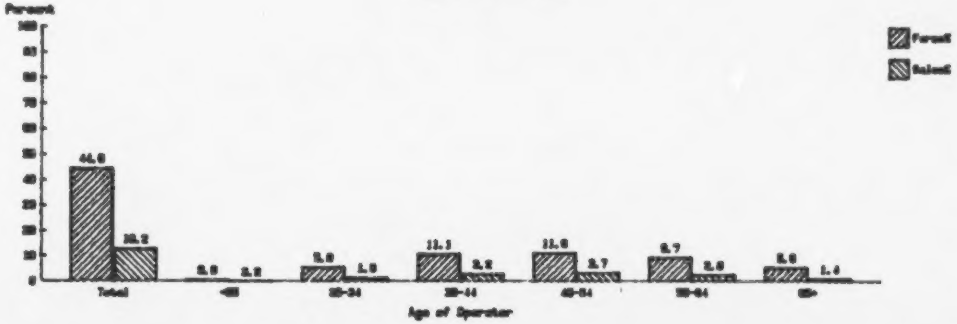
U.S. Bureau of the Census

CHART 9

Percentage of Farms and Sales by
Age and Occupation: 1982
FARMING



OTHER OCCUPATIONS



U.S. Bureau of the Census

STATEMENT OF WILLIAM G. LESHER, ASSISTANT SECRETARY FOR ECONOMICS, U.S. DEPARTMENT OF AGRICULTURE

Mr. Chairman, it is a pleasure to be here today to testify before the Joint Economic Committee on the evolution of agriculture and the importance of the Census of Agriculture in measuring the economic and social factors that have helped shape the direction of this evolution. I have with me Wayne Rasmussen, Historian in the Economic Research Service and David Harrington, Chief of the Farm Sector Economics Branch of ERS. Both Wayne Rasmussen and David Harrington contributed to the drafting of this testimony.

When I was growing up in Cass County, Indiana, in the late 1940's and 1950's, one of the greatest changes ever to affect American agriculture was taking place. Essentially, farmers were applying systems analysis to farm production, even though few people had ever heard of that term. A team of USDA and North Carolina State researchers had found that if a person improved every part of the production process, the resulting increase in productivity, how ever measured, would far exceed the sum of the parts. Since that discovery in the late 1940's, American agriculture has been transformed.

The Census of Agriculture provides us with the yardstick data with which we measure such changes and their impact on farms and the farm population. Between 1945 and 1982, the number of farms in Cass County decreased from 2,056 to 946, while the average size increased from 120 to 235 acres. The amount of land in farming declined slightly but production increased markedly. Corn production increased from 2.5 million bushels in 1945 to 12.9 million in 1982, and soybeans moved from 391 thousand bushels to 2.5 million. Wheat increased by about 20 percent. The number of cattle fell by one-half but the number of hogs doubled.

The change that has taken place in Cass County, over the last four decades, reflects the types of changes that took place generally across the United States—a sharp decline in the number of farms, a marked increase in farm size, and major increases in productivity. These changes have effected every aspect of the food chain from farm production to domestic consumption and international trade. The basic data collected which helps us to understand these changes comes from the Census of Agriculture. However, data for each of the years between censuses are developed by the Statistical Reporting Service of the Department of Agriculture, often in cooperation with the Bureau of the Census. Analsyis of the data, vital to policy and program determination and to decision-making by farmers and agribusinesses is the responsibility of the Economic Research Service.

MEASURING CHANGE IN AMERICAN AGRICULTURE, 1840-1970

The Bureau of the Census first sought information on agriculture in its Census of 1840. Agriculture showed a steady growth over the next two decades, but was to undergo a marked change during the decade of the Civil War. In 1862, Congress passed and President Abraham Lincoln signed four major laws affecting American agriculture—the Homestead Act, the Morrill Act, the Department of Agriculture Act, and the Transcontinental Railroad Act. Later in the decade, stimulated by patriotism, high prices, and a seemingly unlimited demand, farmers put more land into production. Hand labor was replaced with horsedrawn machinery in many farm operations. Between 1860 and 1870 the number of farms, according to the Census, increased from 2.0 million to 2.6 million. Acreage per farm declined from 199 to 153. The value per acre rose from $16.32 to $18.26.

For the remainder of the nineteenth century, with the total number of farms increasing to 5.7 million by 1900, both total production and farm productivity continued to increase. The land grant colleges, the Department of Agriculture, and, after 1887, the State agricultural experiment stations, were encouraging farmers to adopt more productive methods. During most of the period, production was increasing faster than effective domestic and foreign demand, with periods of price-depressing surpluses.

From the turn of the century until World War I, production and productivity leveled off. Supply and demand were essentially in balance for most agricultural commodities. World War I brought a sharp increase in domestic and world demand for food. From 1910 to 1920, wheat acreage harvested increased from 44.3 million acres to 62.4 million and production from 625 million bushels to 843 million. Farmers were told "Food Will Win the War," at the same time increases in prices strengthened the patriotic incentives to plow up more land. Then, with the end of the war and the restoration of agriculture in Europe, foreign demand slackened and American farm prices fell. In 1919 a farmer could sell his wheat for an average price of $2.16, but in 1921 for only $1.03. For more than a decade, prices went up and down but with an overall downward trend. The situation was aggravated by the rigidity of nonagricultural prices and wages, creating a new gulf between farm income and costs. The continuing farm depression was one of the causes of the Great Depression of 1929. Income per farm, according to the Census, was $1,196 in 1920 and $651 in 1930. The number of farms had decreased slightly from 1920 to 1930, with the average size of farms increasing from 149 acres to 157 acres.

Farmers, backed with data from the Census and the Department of Agriculture that reflected their problems, called for Federal action. Attempts were made at first to stabilize markets through cooperatives, but conditions continued to worsen. In 1933, Congress passed the Agricultural Adjustment Act.

That Act, signed on May 12, 1933 by President Franklin D. Roosevelt, gave the Secretary of Agriculture authority to reduce acreage or production by voluntary agreements, to enter into marketing agreements with processors to control prices paid to producers, and to license processors and others with the aim of eliminating unfair practices. Farmers could receive rental of benefit payments and the Department of Agriculture could spend money to expand markets or remove surpluses. These activities were to be financed by a processing tax paid by the first processor of a commodity.

The year after the Act was passed Secretary of Agriculture Henry A. Wallace wrote: "The present program for readjusting productive acreage to market requirements is admittedly but a temporary method of dealing with an emergency." Yet 50 years later this "temporary method of dealing with an emergency," while modified, still remains in effect.

The Agricultural Adjustment Act was aimed primarily at improving the financial situation of the average farmer. It was followed by a number of agencies and laws aimed at particular farm problems. The Resettlement Administration, later the Farm Security Administration and now the Farmers Home Administration, was established by President Roosevelt in May 1935 to help farm families facing major financial difficulties and to retire submarginal land from production.

Congress passed the Emergency Farm Mortgage Act on May 12, 1933 and followed it with the Farm Credit Act of June 16, 1933. The Farm Credit Administration was established in June 1933, to handle both emergency and long-term credit programs. The Rural Electrification Administration was established in 1935.

The Soil Conservation Service was established on April 17, 1935 under authority of the Soil Conservation Act of 1935. It succeeded the Soil Erosion Service of 1933. One of the most acute of the depression-born problems was that of getting food to people in the midst of surpluses. Beginning in 1933, the Federal Government undertook direct distribution of surplus food. School lunch, milk, low-cost milk, and food stamp programs followed.

The production control provisions of the Agricultural Adjustment Act of 1933 were invalidated in 1936 by the U.S. Supreme Court. That judicial body ruled that the Act was unconstitutional because of the processing tax and because the production control provisions were in restraint of trade. The law was replaced in part by the Soil Conservation and Domestic Allotment Act, which attempted to reduce production of surplus crops by payment for improved land use and conservation practices. However, surpluses began to accumulate and new legislation was passed. The Agricultural Adjustment Act of 1938 stressed an "ever-normal granary" plan of balanced abundance, with non-recourse loans for cooperators, acreage allotments, marketing quotas for crops designated by Congress as basic to the economy, and a goal of "parity" prices and incomes for farmers. The parity price was the price for a commodity which would give purchasing power for articles that farmers bought equivalent to the purchasing power of the commodity in the base period, usually 1909 to 1914. Parity income was the per capita net income of farm individuals from farming that had the same relationship to the per capita net income of individuals not on farms as prevailed during the period from 1909 to 1914. This Act, with many modifications, remains the basic agricultural price support and adjustment law in 1984.

Census data provides some measures of the effects of the legislation of the 1930's, although we must remember that this data frequently requires interpretation to be meaningful. From 1930 to 1940, the number of farms declined from 6.3 million to 6.1 million, the average farm size increased from 157 to 175 acres, farm population remained stable, and the average net income per farm from farming rose from $651 to $706. In general, these data indicate that many of the forces that were to transform American agriculture from 1945 to 1970 were in place by 1940.

World War II speeded up the rate of change and saw a new factor—the application of systems analysis to farming, then called the "package of practices." Farmers adopted these new technologies to meet increased demands for farm products and to replace scarce farm labor. The high wartime and postwar prices also encouraged farmers to adopt the new technologies. The number of tractors on farms, for example, rose from 1.6 million in 1940 to 4.7 million in 1960, even though the number of farms declined from 6.1 million to 4.0 million.

World War II sent farm prices over 100 percent of parity and Congress guaranteed high support prices for two years after the cessation of hostilities. After this period, modifications of price support and adjustment legislation were marked by controversy and compromise in the Congress. In the Agricultural Act of 1949, which like the Agricultural Adjustment Act of 1938 is still on the books, major commodities were supported between 75 and 90 percent of parity, depending on supply.

During the 1950's, surpluses began to accumulate and the Congress looked for ways to stimulate foreign trade. The Agricultural Trade Development and Assistance Act of 1954, known as Public Law 480, authorized the government to make agreements for the sale of farm products for foreign currency, to make shipments for emergency relief and other aid (i.e., Food for Peace), and to barter farm products owned by the government for strategic materials. Public Law 480 has proven so valuable that it has been extended into the 1980's, but it has not been a complete answer to the surplus problem.

The Soil Bank program, established by the Agricultural Act of 1956, was yet another large-scale effort to deal with surpluses. The goal was to bring about adjustment between supply and demand for agricultural products by taking farmland out of production. Two reserves were established—an acreage reserve aimed at a short-term withdrawal of land planted to major commodities, and a conservation reserve which allowed producers to withdraw any designated land from agriculture for a period of up to 10 years. In 1957, 21 million acres were in the acreage reserve and 29 million acres in the conservation reserve. Various other types of land retirement programs were in effect in the 1960's.

In 1970, the Census reported that the United States had 3.0 million farms, averaging 373 acres each, and that the farms were averaging $5,754 per year income from farming. Changes in farming and in farm productivity on a scale never before seen had taken place between 1940 and 1970. The next decade was to see economic shifts that were almost as unique as the shifts in production taking place in the preceding decades.

THE 1970'S: HOW THEY CHANGED THE FARM SECTOR

The agricultural sector entered the 1970's with considerable excess production capacity. Farm program payments were at record levels; as many as 62 million acres of land were held out of production. United States exports of grains and oilseeds totalled 57 million metric tons, and the number of farms had declined by more than 50 percent over the previous two decades. But, several forces appeared upon the scene over the first few years of the 1970's:

Strong export growth led by increased trade with the centrally planned economies and by the lower value of the dollar against major foreign currencies;

An apparently tightening world food situation signalled by production shortfalls in widespread parts of the world;

Accelerating inflation in the general economy;

Increases in the value of farm assets at faster rates than inflation in the general economy; and

A series of input price shocks led by energy prices in 1974 and again in 1979.

The effects of these forces were felt in returning of set-aside lands into production, and the rapid expansion of U.S. exports of grains and oil-seeds to 146 million metric tons by the end of the 1970's—nearly triple their 1970 level.

Farm families also discovered that their assets were becoming more valuable. They were getting wealthier—at least on paper. Many found that lenders were quite willing to finance major land purchases on the basis of the increased value of the farmer's holdings and the expected continuing increase in values of agricultural land. Their net worths increased with every expansion. It was viewed as a no-risk proposition, for many believed that land prices would never turn down.

Farm families, like others in the economy, also found that interest rates increased approximately as fast as the inflation rate. This, combined with price increases for purchased inputs that were sensitive to either the inflation rate or the prices of energy, created a squeeze on the net margins farmers use to service land debt, at just the time that land debt and servicing costs were increasing rapidly. The resulting squeeze on cash flow led many farmers to "monetize" the capital gains on their land by rolling over short-term debt into land mortgages. The cash flow shortfalls were more than offset by the capital gains on farmland, so both the farmers and their lenders were willing to continue to expand and roll over debt.

Farm asset values, farm debts, and net worths of farmers all grew faster than the inflation rate throughout the 1970's (Chart 1). Both farmers and nonfarm investors found that investments in farmland were excellent hedges against inflation, and provided ways to reduce taxable income.

Another phenomenon of the 1970's was a resurgence of population growth in rural areas. The growth of "exurban" (beyond the suburbs) fringes of "farmettes" (very small acreages) and rural residences around urban centers was well documented by the end of the 1970's. Lifestyle motives for living in rural areas and on small, part-time farms led to increases in the numbers of very small farms (less than $10,000 of sales) initially in the Northeast and the

Pacific Northwest, but more recently in most of the Atlantic and Pacific coastal states.

All of these changes led to a slowing of the decline in farm numbers, but also to an increase in the "dualism" of U.S. agriculture. The farm sector was becoming increasingly characterized by a large number of very small farms which accounted for little production; a small, but increasing number of large farms which accounted for most of the value of agricultural products sold; and a disappearing middle group that faced severe pressures to either get bigger or get smaller and find ways to supplement their farm incomes in order to improve their economic prospects.

Over the 1970's, strong export markets and relatively buoyant market prices in most years led to a nearly steady decline in government support costs and government payments to farmers from their 1973 peak. However, the increasing role of general economic policy in determining the competitiveness of U.S. agricultural commodities abroad, and the increasing role of tax and macro-economic policy in determining the investment climate for farm assets were becoming evident to farmers and policymakers alike over the decade.

WHERE WE ARE NOW

The conditions of the 1970's abruptly changed in the early 1980's. Generally growing world food supplies, combined with a strong dollar and many other factors, reduced the export demand for U.S. agricultural products. Control of the rate of inflation led to a retrenchment of the buoyant expectations of the 1970's and a readjustment of farmland values. The decline in the inflation rate was accompanied by lowered expectations for net returns to land, and by higher real interest rates (interest rates adjusted for inflation, Chart 2), which in turn led to a decline in land values that started in 1981. The legacies of the 1970's are still with us in the form of significant financial adjustment problems for some farmers—especially those who entered the 1980's in a highly leveraged position. These farms have a high cost structure because of high debt/assets ratios, high real interest rates, and prices of purchased inputs that reflect the effects of past inflation. Government costs for support of commodity prices and farm incomes increased rapidly in the early 1980's as international demands slackened and as prices and costs veered sharply away from the inflationary paths anticipated when the Agriculture and Food Act of 1981 was enacted.

The 1982 Census of Agriculture provides us with a benchmark of how the farm sector has changed. During the late 1970's, farm numbers slowed their 40 year decline and now stand at 2.2 million farms (Chart 3). Sizes of farms by both acreage and sales class measures have increased and the "dualistic" nature of the size distribution is becoming even more apparent (Charts 4 and 5). The farm sector continues to be characterized by a concentration of small farms which account for a small proportion of production, and a few large farms that account for most of the value of agricultural products sold (Chart 6). This chart shows that the smallest 50 percent of farms (the 1.2 million that sell less than $10,000 of sales per year) account for only about 5 percent of production. By contrast the largest 5 percent of farms (the largest 110 thousand farms) account for approximately 50 percent of production. Farms in the larger sales classes (over $100,000) are expanding in number while farms in the more moderate sales classes are declining in number (except for the lowest sales class).

As an illustration, a cash grain farm in the Corn Belt with approximately 160 acres would have about $60,000 in gross sales at current yields and prices. Farms of this size only partially employ the farm family; thus, they tend to provide relatively low family incomes. Such farmers face the choices of expanding to a size that will provide an adequate family living, contracting their farm operations and seeking off-farm employment, or selling the farm and taking non-farm employment. Since the first option is sometimes difficult for operators of smaller farms to follow, many choose either of the latter two options, thus reinforcing the "dualism" of the farm sector.

Ownership and tenure of farm families have changed since the 1930's but had evolved to fairly stable patterns by the 1970's (Chart 7). Owner-operator farms (full ownership) continue to dominate among the smaller sales classes; but the larger commercial farms are predominantly part owners, on average renting about as much land as they own. Full tenants have declined in number to only 11 percent of farms; and they are no longer the social and economic problems that tenant farms were in the 1930's. Contrary to some popular beliefs, non-family corporate farms are *not* a threat to family-farm agriculture. Even though non-family corporations in farming increased from 1978 to 1982, their numbers are very small (7,100 farms in 1982, one-third of 1 percent) and their share of production is less than 5 percent. The 52,000 family corporations in farming are essentially family farms which have found the corporate form of organization preferable from a financial and tax management standpoint. Finally, non-operator ownership of farmland is increasing but most of the non-operator owners are either retired farmers or non-farm heirs of farm operator families.

Dominant crop enterprises in 1982 included corn, wheat, soybeans, and hay as the crops accounting for the most total acreage (Charts 8 and 9); however, hay was grown on more farms than any other single crop, followed closely by corn for grain or silage. Dominant livestock enterprises now include: beef cattle, 957 thousand farms; hogs and pigs, 329 thousand farms; milk cows, 278 thousand farms; and fed cattle 240 thousand farms (Chart 10).

Changes in the farm sector, which the Census of Agriculture has documented over the years, indicate progressive integration of farms with the rest of the economy and progressive industrialization of farms. Farms and agriculture are no longer isolated and unaffected by what happens in the rest of the economy. They are increasingly evolving to either commercial businesses or small, part-time enterprises engaged in by people whose primary source of livelihood is not farming. Rural people are also becoming more like their urban counterparts.

THE ROLE OF THE CENSUS IN TRACKING CHANGE

Accurate and timely information and a correct perception of the agricultural sector is essential for the effective design and administration of policies. We have mentioned the changing character of farms, and their increasing tendency toward a dual structure. With such diversity, it makes it more difficult for any single set of agricultural policies to satisfy everyone.

We have also mentioned the increasing role of general economic policies and other overall policies in determining the well-being of the farm sector and in determining the budgetary cost of farm commodity programs. Over the years, the Census of Agriculture has proven an invaluable source of information for discovering and documenting the changing nature of the farm sector and the effects of these policies on individual farms. The farm problems that emerge can only be discovered and documented through a comprehensive Census and appropriate follow-on surveys. In today's world, it appears that information solely on organization, production, and traditional inputs is an insufficient basis for making or administering policy. The emerging situation of increasing numbers of small farms, increasing concentration of production among large farms, new types of enterprises, and unique ownership and financial organizations require the best information possible.

The problems of identifying and enumerating farms and of gathering financial information crucial to the setting of policy will become more important in the future, not less important. The Census of Agriculture is one cornerstone of the information system necessary for setting rational and supportive public policies for the agricultural sector.

The Department of Agriculture is the other major cornerstone in the information system essential to maintaining our Nation's productive agriculture and to selling our agricultural products. When the Department was established in 1862, its major duty was to "acquire and to diffuse among the people of the United States useful information on subjects connected with agriculture." The Commissioner of Agriculture was given the duty to "acquire and preserve all information which he can obtain by means of books and correspondence, by practical and scientific experiments, by the collection of statistics, and by any other appropriate means." This law, with some modification, is still in effect. Several Department agencies "acquire and diffuse" information, with the Statistical Reporting Service and the Economic Research Service being responsible for these functions in collecting and interpreting agricultural statistics. This role is even more important today than it was in 1862. Every part of the American economy is concerned with the continuing economic evolution of agriculture—an evolution that can be understood only through a strong, efficient system of economic information.

EFFECTS OF ECONOMIC AND OTHER POLICIES

Finally, Mr. Chairman, you requested information on the effects of farm programs and other Federal policies on the structure and performance of the agricultural economy. To answer this request, let me say that I believe economic forces are primarily responsible for the decline of farm numbers from their 6.5 million peak in the mid 1930's to today's level of 2.2 million—a decline that continued through years of heavy government involvement in agriculture during which several different types of policies were tried. Rapid adoption of labor-saving technologies occurred throughout the period. These labor saving technologies allowed families to operate much larger farms, but they also had the effect of making smaller farms and older technologies uneconomic, leading to pressures to either expand the farm or sell out to an expanding neighbor. In essence, economic forces have overshadowed, to a large extent, the other forces that may have been pulling in different directions.

This process was recognized by the late 1950's as the "treadmill of technological advance." Professor Willard Cochrane stated in his book entitled "A City Man's Guide to the Farm Problem":

> . . . [T]he innovators reap the gains of technological advance during the early phases of adoption, but after the improved technology has become industry wide, the gains to innovators are eroded away through falling product prices or rising land prices or a combination of the two, and in the long run the specific income gains to farmers are wiped out and farmers are back where they started—in a no profit position. In this sense, technological advance puts farmers on a treadmill.

As farms attempt to expand to capture the benefits of technological advances and economies of size, they must necessarily absorb other small farms—leading to the rapid decline of farm numbers experienced from the late 1940's to the late 1960's.

The treadmill just described brought some positive benefits as well as enormous economic and social adjustment problems. Farms themselves became more efficient and better able to support farm families, consumers benefited from the lower food costs that resulted from a more efficient, dynamic farm sector, and the farm sector was transformed and poised for the rapid expansion of export demand that was to take place in the 1970's. Some farm families who migrated to cities were unable to achieve standards of living comparable to non-farm workers; but others fared fairly well because of the skills and work habits brought from agriculture. Other families were able to remain in the rural areas that increased steadily over the 1960's and 1970's.

By the late 1960's and 1970's increasing off-farm employment opportunities in rural areas allowed smaller farmers to supplement their income through off-farm jobs. This factor, along with the attractiveness of owning and operating a small farm, led to a slowing of the rate of decline of farm numbers—especially among smaller farms. For the large farms, economies of size improved their economic positions such that they could bid more for land than could medium-size farms. Since their per unit costs were lower than their smaller competitors—and usually lower than the prevailing market prices—every expansion improved their net incomes.

While other economic forces were also at work in the transformation of agriculture, there is general agreement that these—technological advances, economies of size, and consolidation of small farms into economic units—are the most important economic forces. However, they can be accelerated or decelerated by a number of public sector policies, not all of which are specific to agriculture.

Probably one of the more important set of policies that affect farm structure and performance are the macro-economic policies that control inflation, interest rates, and international currency exchange rates. The agricultural sector has been shown to be especially sensitive to these variables. For example, farmland values increased faster than the inflation rate in the 1970's and declined sharply when the inflation rate declined. Interest expenses now account for 15 percent of all production expenses—the largest single item of farm expenses. Similarly, demand for our farm products declined. Readjustment difficulties resulted from the world-wide recession of the 1980's as well as from the macro-economic policies necessary to control the inflationary spiral that gripped the Nation at the end of the 1970's. We do not have enough evidence to definitively say what the effects of these policies have been on the structure of agriculture—whether they have accelerated or decelerated the trends embodied in the overall economic forces.

Tax policies are also cited as important policy factors affecting agriculture. Tax provisions that affect agriculture receive a lot of attention because several tax regulations and decisions have created ways of converting current income into net worth or into capital gains income without liability for paying current income taxes. The most mentioned of these include:

The option to use cash accounting methods;

Unlimited write-off of farm losses against nonfarm income;

"Current expensing" of investments in orchards and vineyards;

Capital gains treatment of income from the sale of certain classes of livestock such as breeding and dairy animals; and

Tax credits and accelerated depreciation for certain types of single purpose structures such as hog facilites or grain storage facilities.

To the extent that such tax policies affect agriculture more than they do other industries, their effects on the farm sector may have been:

To make current net cash income (which is calculated with cash incomes and expenditures, similar to cash basis income tax) a downward biased measure of the economic returns of farmers;

To cause asset values to become inflated by their expected returns as tax shelters;

To foster ownership of farm assets by those who can best take advantage of the tax benefits; and

To stimulate more investment in agriculture than would otherwise be the case.

Also, credit policy apparently can accelerate or decelerate the rate of change in farm numbers and sizes. Limited access to credit was a severe problem of agriculture up until about the 1950's. Limited availability of credit prevented many farms from attaining sizes that could support the farm family. Providing improved access and terms for farm operating and investment capital was a major policy tool in aiding the transition of the farm sector from one dominated by small, uneconomic, low income farms, to a structure that now includes large as well as small farms, with incomes and net worths more nearly comparable to the nonfarm economy.

In the 1970's access to credit, along with inflationary expectations, contributed to the rapid growth of large family farms. To the limited extent that subsidized credit or preferential credit terms are available, they most likely have had the effect of maintaining more resources in agricultural production than would otherwise be the case.

Commodity policies have also likely influenced the structure of agriculture—although there have been so many different types of programs they likely pull in different directions. The effects of these commodity programs on the structure of the farm sector have not been proven to either accelerate or decelerate the consolidation and growth of farms, and hence the decline in numbers of farms. Some suggest that income and price supports—such as for wheat, feed grains, cotton, and rice—favor the larger and better established farms because the benefits received by farmers are proportional to their volume of production. They conclude that such programs must accelerate the growth and consolidation of such farms. However, others point out that cash grain farmers are not nearly as large as some other types of farms, nor is grain production as concentrated among the large farms as production of broilers, beef feeding, vegetable and fruit—none of which have had extensive and direct government involvement.

In addition, others argue that highly structured policies, such as for tobacco and peanuts, have probably maintained more farms in the production of these crops than there would have been otherwise. You can see from comparing Charts 8 and 9 that many more farms are producing tobacco on smaller acreages than any other commodity.

Still others argue that, if commodity programs were not used to stabilize prices and returns in some sectors, then the private sector would evolve its own methods and adjustments for handling the uncertainty. They point to broiler production, which has had no commodity programs nor any other direct form of government involvement, and which evolved over the 1950's and 60's into a highly sophisticated group of producers who contract with farmers to grow out broilers for a contractual margin. This subsector of agriculture has probably departed the farthest from the traditional owner-operator family farm model that still continues to characterize most of agriculture.

SUMMARY

We have seen, Mr. Chairman, that agriculture has gone through and is still going through changes since this Nation won its independence. Economic opportunities led farmers to move west and open new lands, to adopt new technologies as they were developed, and to turn from self-sufficiency to commercial agriculture. From our beginnings, when Congress made public lands readily available to farmers, until today, when farming is undergirded by a system of research, education, regulation, price support, and export promotion, the American people have recognized the importance of farming. In 1790, over 90 percent of working Americans were farmers; today 2.6 percent of the population provides our food and fiber.

This is indicative of the scope of both the economic and social changes that have taken place in farming and farm life.

In my judgment, all policies operate in an environment of economic forces which contribute to structural change in the farm sector. Public sector policies can only slightly accelerate or slightly decelerate the economic forces that are already at work. Many policies affect the structure and performance of the agricultural sector in a variety of ways and their joint effect cannot be precisely determined. In addition, it is difficult to determine whether such policies are affecting the agricultural industry differently, or to a greater extent, than similar types of policies are affecting other industries.

It is difficult to measure, at least with any precision, the impacts of economic, social, and governmental forces on the American farmer. But whatever they have been, Americans enjoy a plentiful supply of wholesome, varied foods at the lowest cost of any people in the world. Overseas consumers of American products also are assured of quality products at reasonable cost. However measured, American agriculture is one of the great success stories of the world.

CHART 1: FARM REAL ESTATE VALUES AND TOTAL FARM LIABILITIES, 1970-1983

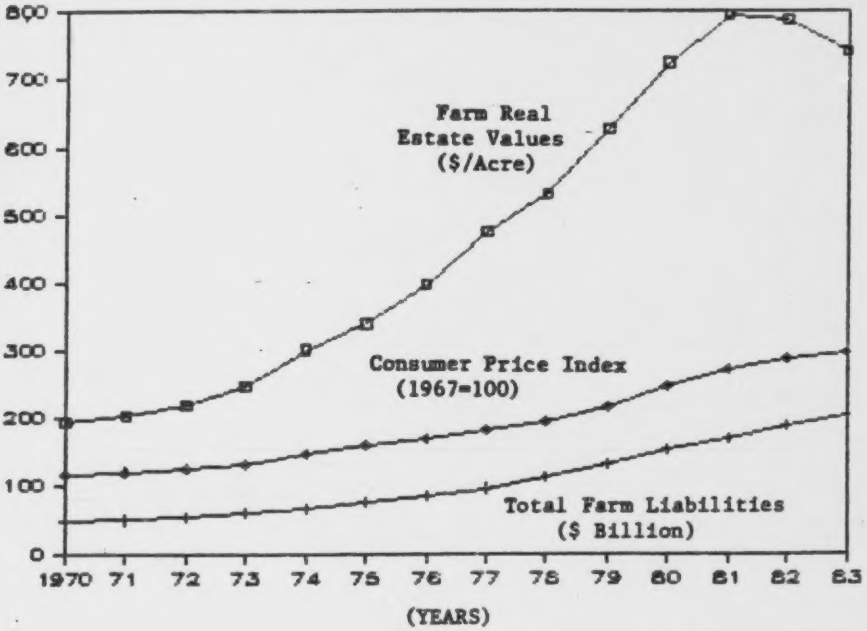


CHART 2: INFLATION AND INTEREST RATES, 1970-1983

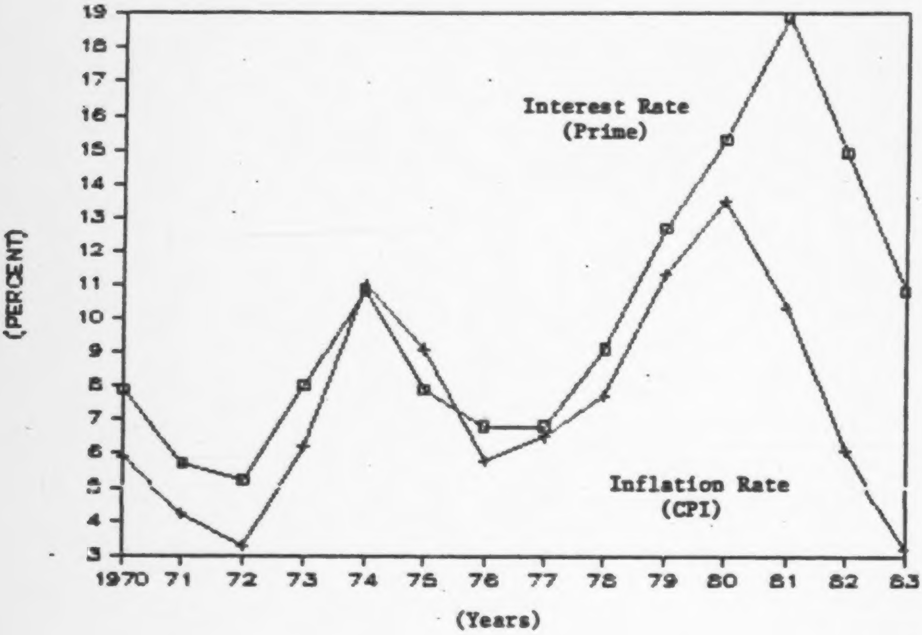


CHART 3: FARM NUMBERS AND SIZES, 1930-1982

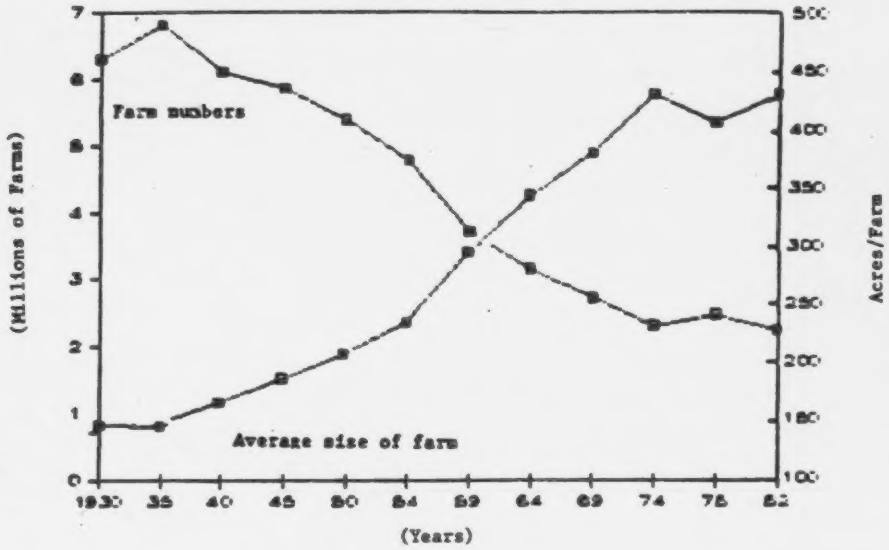


CHART 4: FARMS BY SALES CLASS, 1982

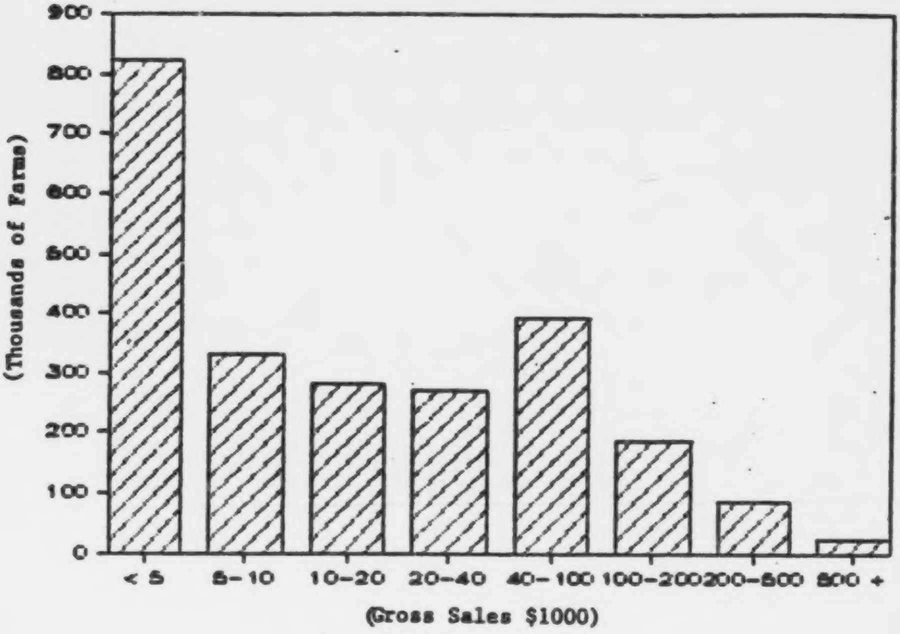


CHART 5: FARMS BY ACRE CLASSES, 1982

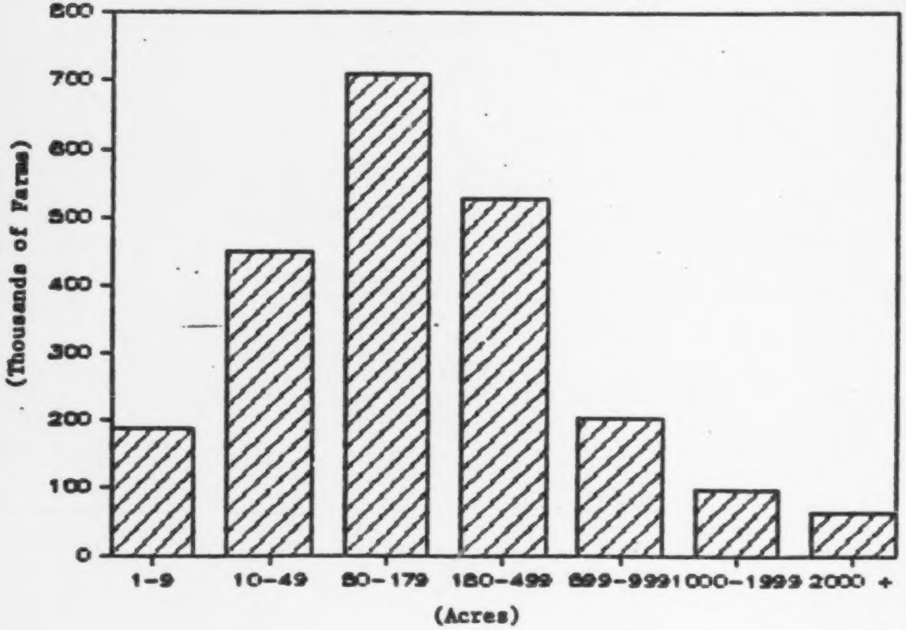
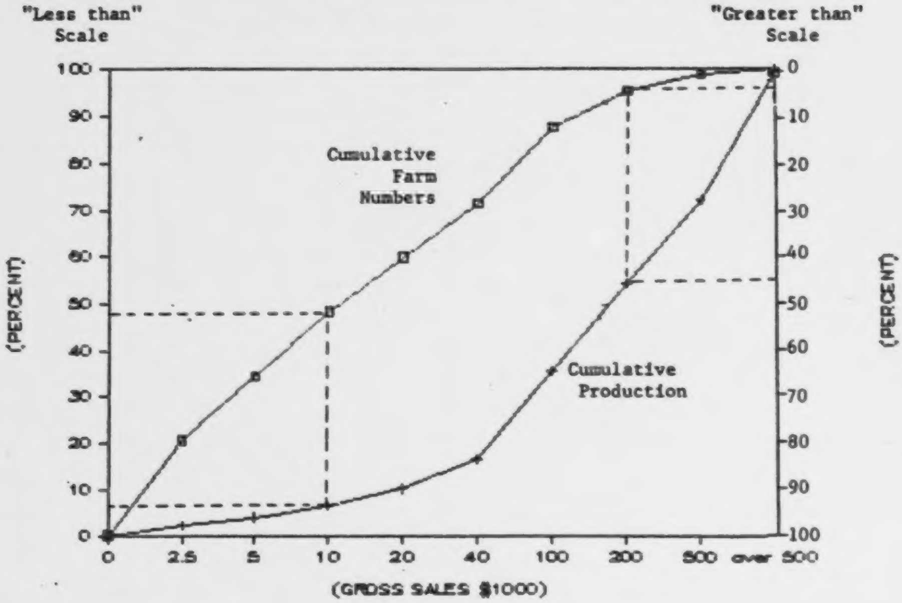


Chart 6: Concentration of Farm Numbers and Farm Production, 1982



- Reading from left scale--The 50 percent of farms that are less than $10,000 in gross sales produce 5 percent of total agricultural production.

- Reading from the right scale—The 5 percent of farms with sales greater than $200,000 produce 50 percent of total production.

CHART 7: TENURE OF FARM OPERATORS, 1930-1982

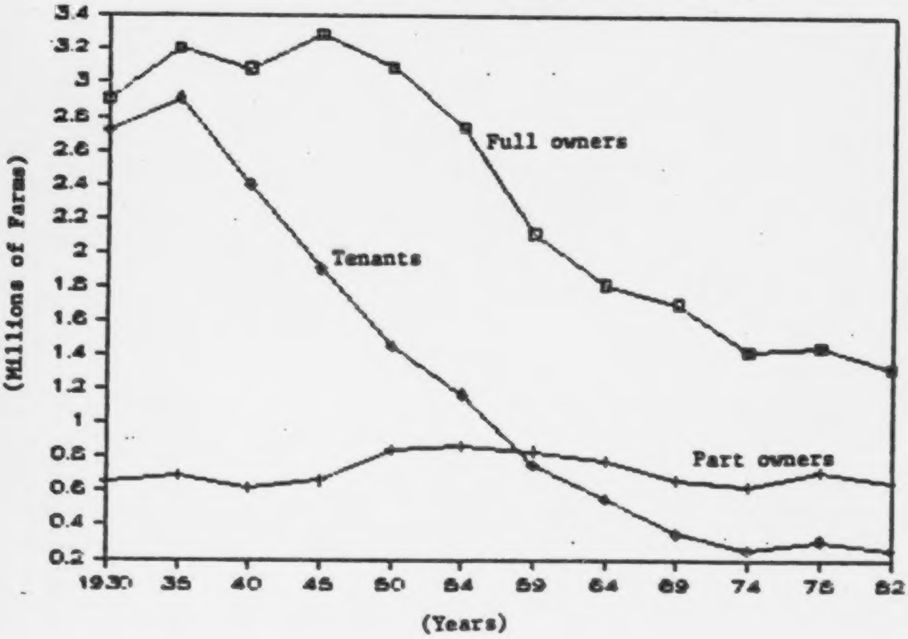


CHART 8: ACREAGES OF PRINCIPAL CROPS, 1982

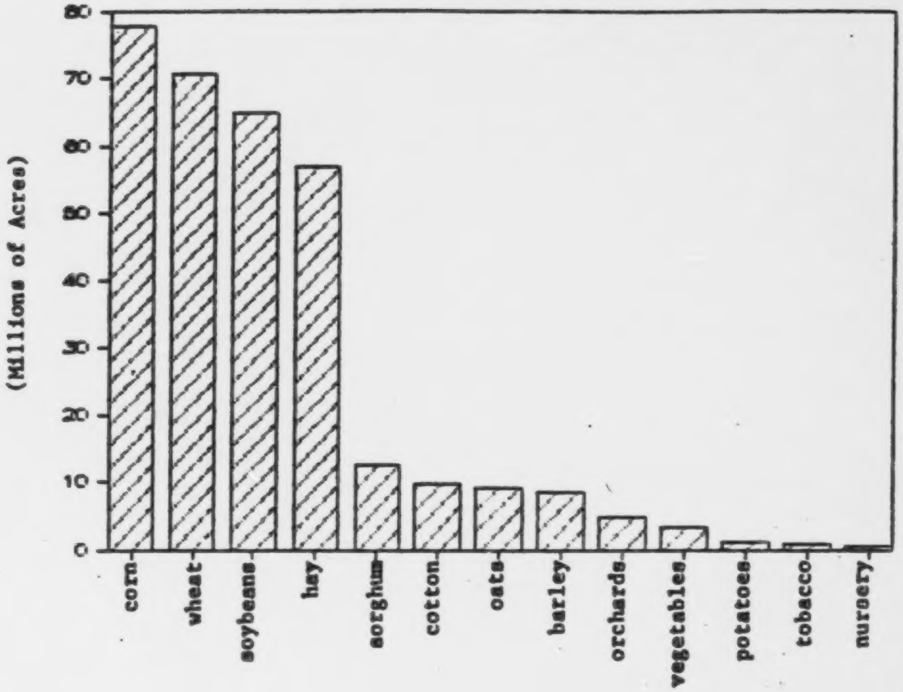


CHART 9: NUMBERS OF FARMS PRODUCING SELECTED CROPS, 1982

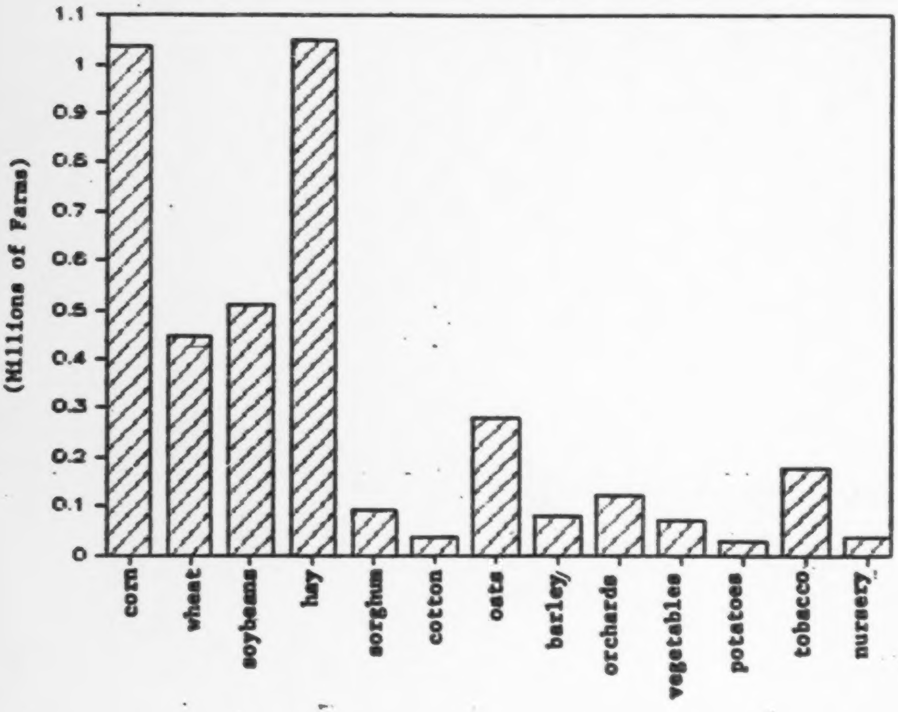
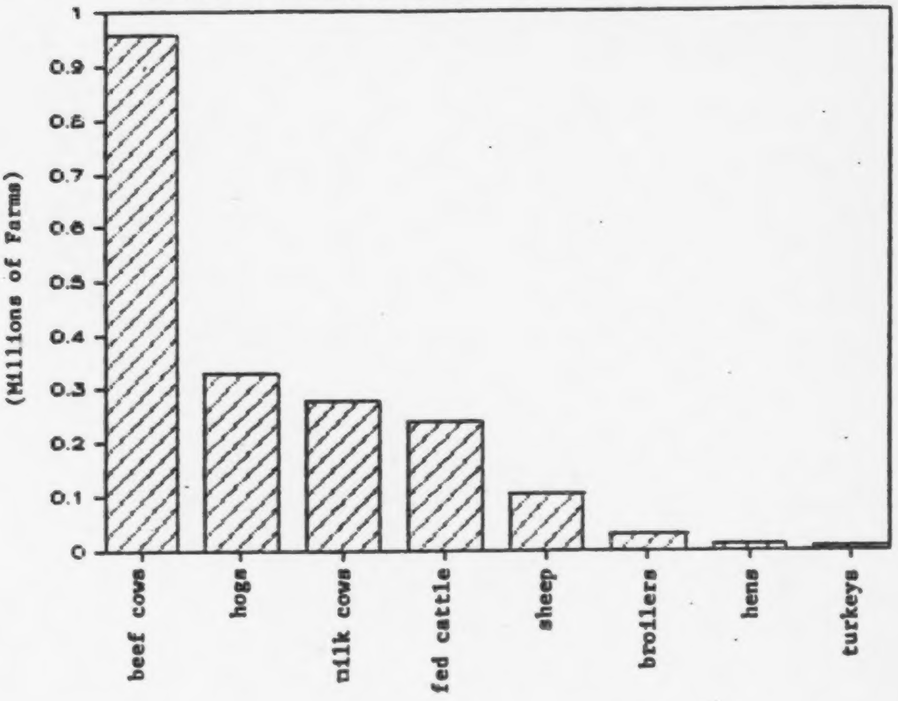


CHART 10: NUMBER OF FARMS WITH SELECTED LIVESTOCK, 1982



STATEMENT OF RONALD C. WIMBERLEY, DEPARTMENT OF SOCIOLOGY AND ANTHROPOLOGY, NORTH CAROLINA STATE UNIVERSITY, RALEIGH

ACKNOWLEDGEMENTS

This presentation is, in part, a contribution of USDA CSRS Regional Project S-148, "Changing Structure of Agriculture: Causes, Consequences and Policy Implications," through the North Carolina Agricultural Research Service Project 11148. While the author takes responsibility for the manuscript at hand, appreciation is expressed to S-148 research colleagues who have collectively developed various ideas, to Linda L. Reif for assistance in data preparation and computer analysis for the U.S. data, and to James McKenzie for additional assistance. Parts of the analysis draw from and expand upon a line of studies conducted by the author on North Carolina agricultural structure.

INTRODUCTION

The most basic short term and most vital long term problem of our society is to create and maintain an agricultural system which can provide food and fiber. This is necessary in order to sustain both social order and life itself. The issues addressed by this Committee cut across political lines. No political body can disregard them. Rather, food and fiber, along with the farms that provide them, are traditional concerns of political behavior.

Since Henry IV of France, a classic political slogan has expressed the hope of, "A chicken in every pot." The political logic of this promise is still compelling.

So, how do we get the chickens—and other commodities—into the pots? It is through that complex set of individual and group interactions that must take place if we are to eat in a society where so few produce and in a world where so many consume. These social interactions are institutionalized into farming and agricultural systems. But even institutionalized systems must adapt to changes in the physical and social worlds and must try to anticipate potential problems. Unless we can make these adjustments, we lose the luxury of having to deal with other, less vital types of social problems.

This Committee and its staff have already assembled and reviewed many of the materials pertaining to the policy questions concerning our agricultural system.

The testimony offered here deals with certain sociological and economic aspects of research made possible through a Cooperative Regional Project supported through Hatch and state funds at 1865 and 1890 Land Grant Universities. The regional project, denoted as S-148, "The Changing Structure of Agriculture: Causes, Consequences, and Policy Implications," has involved 21 sociologists, economists, and several others from 17 universities in 13 States and Puerto Rico.

These states, university experiment stations, and scientists are: Alabama, Auburn University, Joseph J. Molnar; Florida, University of Florida, Keith Carter and Lionel Beaulieu; Georgia, Fort Valley State College, Mack Nelson; Iowa, Iowa State University, Peter F. Korsching; Kentucky, University of Kentucky; C. Milton Coughenour; Louisiana, Louisiana State University, Quenton A.L. Jenkins; Mississippi, Mississippi State University, C. Ray Sollie, and Alcorn State University, Alfred Stewart; Missouri, University of Missouri, William D. Heffernan; North Carolina, North Carolina State University, Ronald C. Wimberley, and North Carolina A&T State University, Sidney Evans, Oklahoma, Oklahoma State University, Luther Tweeten, and Langston State University, Keith Hawxby and Irving Russell; Puerto Rico, University of Puerto Rico, Edna Droz and Vivian Carro; South Carolina, Clemson University, Thomas A. Lyson and Steven C. Lilley; Tennessee, University of Tennessee, Robert H. Orr and O. Neal Walker; and Texas, Texas A&M University, Howard W. Ladewig. The CSRS Representative to this project is Eldon E. Weeks. The Administrative Advisor since the inception of the work has been George J. Kriz, Associate Director of the North Carolina Agricultural Research Service at North Carolina State University.

The objectives of the S–148 project on the changing structure of agriculture have been:

1. To identify and measure characteristics of farms and related activities as organizational units.
2. To assess the impacts that external variations in social, economic, and institutional factors have on farms of various sizes and types.
3. To assess the impact of organizational characteristics on career commitment and well-being of individuals and families on farms.
4. To assess the development of farm sizes and types as related to population change, patterns of man-land relationships, and community structure.

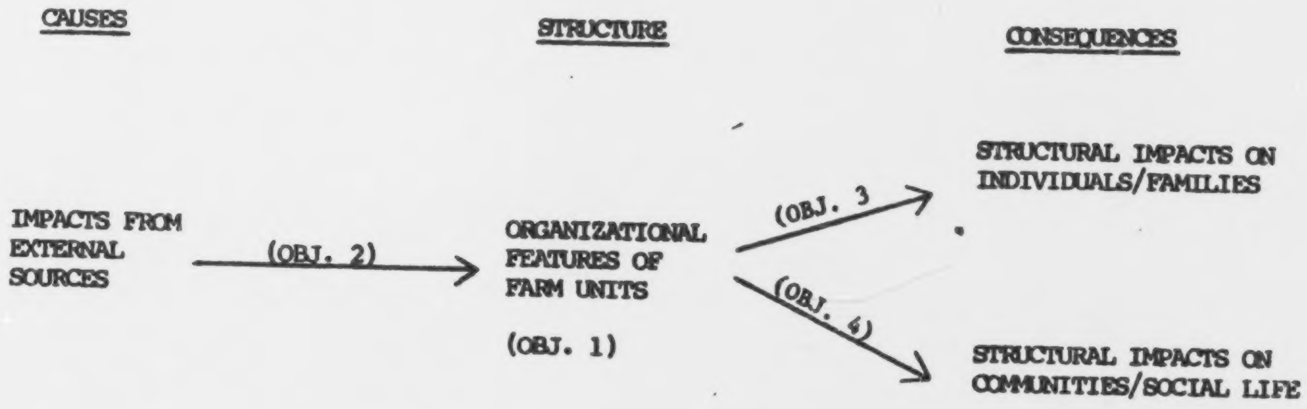
Sketched into a model, the structural conditions measured in Objective 1 are effected by external causes including technology, credit, markets, information, and public policy. The nature of such relationships between external conditions and farm structure are sought via Objective 2. In turn, Objective 3 is to see how structural differences relate to the commitments of those who farm as an occupation and to the well-being or quality-of-life of farm households. Objective 4 is to learn more of how differences in agriculture relate to community and social structure for places dominated by different types of farm structure.

The cumulative findings of the sociologists and economists on this project, as it has been conducted in the various states on various objectives, cannot be covered on a single occasion or in a single report. Indeed, S–148 researchers anticipate a symposium and an anthology of reports on these objectives. An extensive bibliography already exists from these studies. However, the Appendix to this presentation contains a succinct review of S–148's findings.

Most of the material reported here deals with the first objective on the measurement of agricultural structure and how it varies across the nation, its regions, its states, and down to the county-by-county level. Next, several trends in these characteristics are to be highlighted. Third, some thoughts will be offered about the relationship of agricultural structure and community structure. Finally, some future research directions will be identified along with further needs to monitor the S–148 objectives.

FIGURE 1

REGIONAL PROJECT S-148, "THE CHANGING STRUCTURE OF AGRICULTURE:
CAUSES, CONSEQUENCES, AND POLICY IMPLICATIONS"


CAUSES
STRUCTURE
CONSEQUENCES
IMPACTS FROM EXTERNAL SOURCES
(OBJ. 2)
ORGANIZATIONAL FEATURES OF FARM UNITS
(OBJ. 1)
(OBJ. 3
(OBJ. 4)
STRUCTURAL IMPACTS ON INDIVIDUALS/FAMILIES
STRUCTURAL IMPACTS ON COMMUNITIES/SOCIAL LIFE

STRUCTURAL PROFILES OF U.S. AGRICULTURE

When agricultural structure is measured or analyzed, it is often through the use of single indicators such as farm acreage, gross sales, or numbers of farms in a given location. Little attention has been given to the use of indexes containing multiple indicators and whether different types of indicators may show different patterns. The need for structural indexing of the nation's agriculture is somewhat analogous to that used for other types of social and economic indexes.

In order to gauge our agricultural structure, comparable indicators are needed across places and time periods. The best source of these data is the U.S. Census of Agriculture. In 1978, the most recent time for which analyzable data are currently available, the agricultural census contains a population of 3,053 counties from which information is reported.

Structural indicators

Types of indicators.—On the basis of their social, organizational, or structural connotations, 22 indicators of county-level farm structure are obtained from the 1978 Census. These fall into categories of scale, ownership, operation, operator characteristics, and labor resources. They are described as follows:

Scale

1. Total number of farms in county.
2. Proportion of county's land in farms.
3. County's mean farm size in acres.
4. Number of small farms in county having annual sales less than $2,500.
5. Total value of farm product sales in county.
6. Total value of farm real estate in county.

Ownership

7. Unincorporated individual and family owners.
8. Partnerships.
9. Corporations including those owned by families.

Operation

10. Full-owner operators.
11. Part-owner operators.
12. Tenant farm operators.

Operator characteristics

13. Principal occupation of the farm operators, i.e., full- or part-time farmers.

14. Operators' residences either on or off the farm.
15. Mean age of farm operators in county.

Labor resources

16. Number of farms having hired workers.
17. Number of farms with 10 or more hired workers.
18. Total number of hired farm workers in county.
19. Expenses for contract labor.
20. Expenses for customwork.
21. Expenses for energy and petroleum products.
22. Estimated market value of all farm machinery and equipment.

Findings [1]

To learn if these 22 variables represent one thing or several—to see if there are one or more separate types of agricultural structure—these indicators were statistically analyzed by the principal axis technique for factor analysis. Factor analysis tests correlations among variables to find whether one or more underlying mathematical dimensions might explain anything a set of measurements share in common.

Indeed, it is discovered that agricultural structure is not simply one thing; it is several. Three underlying factors were found. Agricultural structure is three-dimensional. Further statistical analysis using promax factor rotations of the three dimensions revealed the following patterns among the structural indicators in the census data:

Factor I. Corporate/commercial agriculture indicators

5. Greater gross sales.
6. Higher farm real estate value.
9. Corporate ownership.
17. Many farms with 10 or more hired workers.
18. Many hired workers in county.
19. Higher contract labor expenses.
20. Higher customwork expenses.
21. Higher energy expenses.

Factor II. Large farm agriculture

2. Proportion of county's land in farms.
4. Absence of small farms selling less than $2,500.

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[1] Technical details of this analysis are reported in a separate paper, "Structural Profiles of American Agriculture," by the author.

6. Higher farm real estate value.
7. Individual/family ownership.
8. Partner ownership.
11. Part-owner operators.
12. Tenant operators.
13. Full-time farm operators.
14. Operators reside on farms.
15. Younger farm operators.
21. Moderate energy expenses.
22. High machine and equipment values.

Factor III. Smaller family farm agriculture

1. Many farms per county.
4. Many small farms selling less than $2,500.
7. Individual/family ownership.
10. Full-owner operators.
14. Operators reside on farms.
16. Many farms with hired workers.

Corporate/Commercial Agriculture is scale neutral but high in sales, labor, and energy use. *Large Farm Agriculture* covers large portions of land in counties where it is found and tends to have part-owner or tenant operators that are full-time farmers. However, they are younger than other types of farm operators, may reside on the farms, and have high machine and equipment values along with energy expenses while using little farm labor. *Smaller Family Farm Agriculture* is found in counties with larger numbers of farms that are independently owned and operated by their residents.

The most distinctive indicators in each dimension—those marked with asterisks in the preceding list—are combined to form an index of each dimension. The scores for each county may be used in various types of analyses of the nation's agricultural structure. They also may be used to map the existence of structural conditions across the country.

The geography of the three U.S. agricultural structures

Just where do these structural dimensions of agriculture occur in the United States? Are certain dimensions more prevalent in particular regions? What combinations of these dimensions are found in the same counties? To answer these questions, each index score is mapped, county-by-county, across the United States. Counties higher on the index appear as the darker shades in the maps.

The map for each of these indexes shows its respective, national distribution. When overlapped, these maps graphically demonstrate the correlations among the structural indexes. Recall that, for sake of convenience in diagrams, the maps show only categories of each index.

In Map I, Corporate/Commercial Agriculture is predominate in the mid-west and plains. It also occurs in farming areas of the Pacific coast and southwest, the Texas Gulf coast, the Mississippi Delta, and spots along the Atlantic coast including Florida, North and South Carolina, and an area ranging from Maryland to Maine. In Map II, Large Farm Agriculture is found in similar locations with a bit less on the east coast and in the northwestern quadrant of the county. Beyond these locations, Map III shows Smaller Family Farming to be more of an eastern and southern activity which stops about midway across the nation before resuming along the west coast.

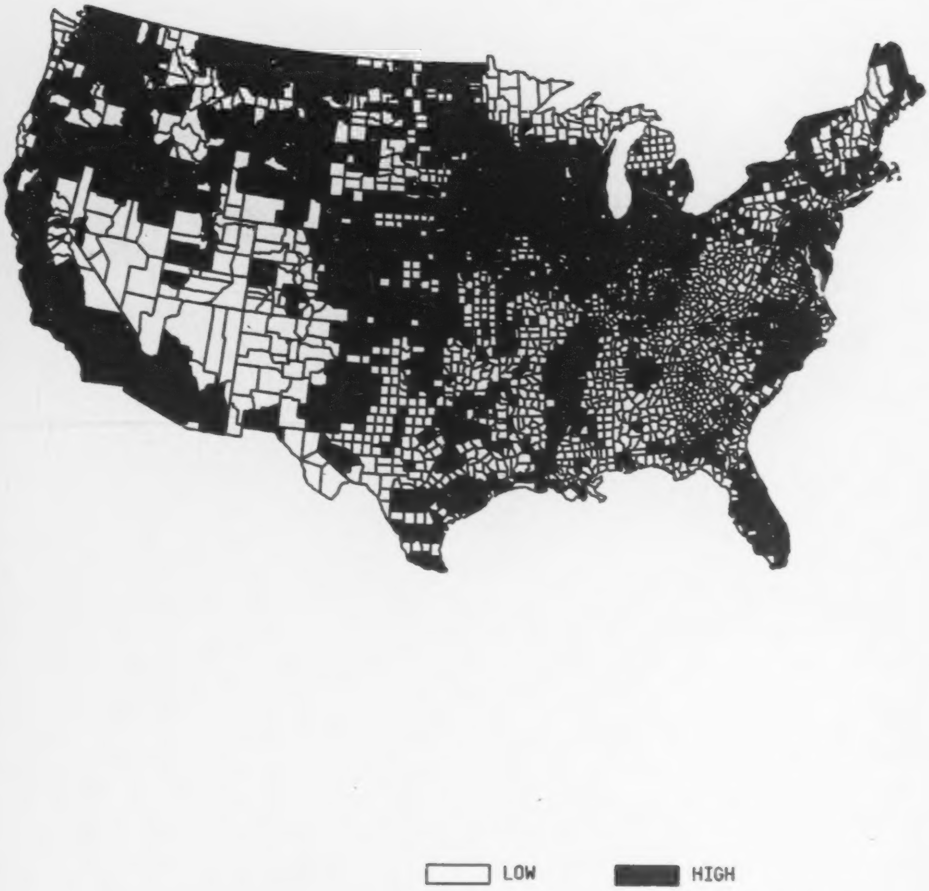
The three structural dimensions correlate moderately. Often, a county near or above average levels in one index will be high in one or both of the remaining indexes. On the other hand, many counties are high in no dimensions or in only one dimension.

In general terms, a comparison of all three maps reveals many counties are above average on all three dimensions. This is quite common in the midwest, the plains, and in portions of the northwest and the southwest as well as for certain eastern areas around New York, the Carolinas, Florida, and the Mississippi Delta. The only areas notably below average on all structural dimensions are the southwestern mountain and desert areas. Most of the southern counties are above average in one or more dimensions.

Policy implications of agricultural structural profiles

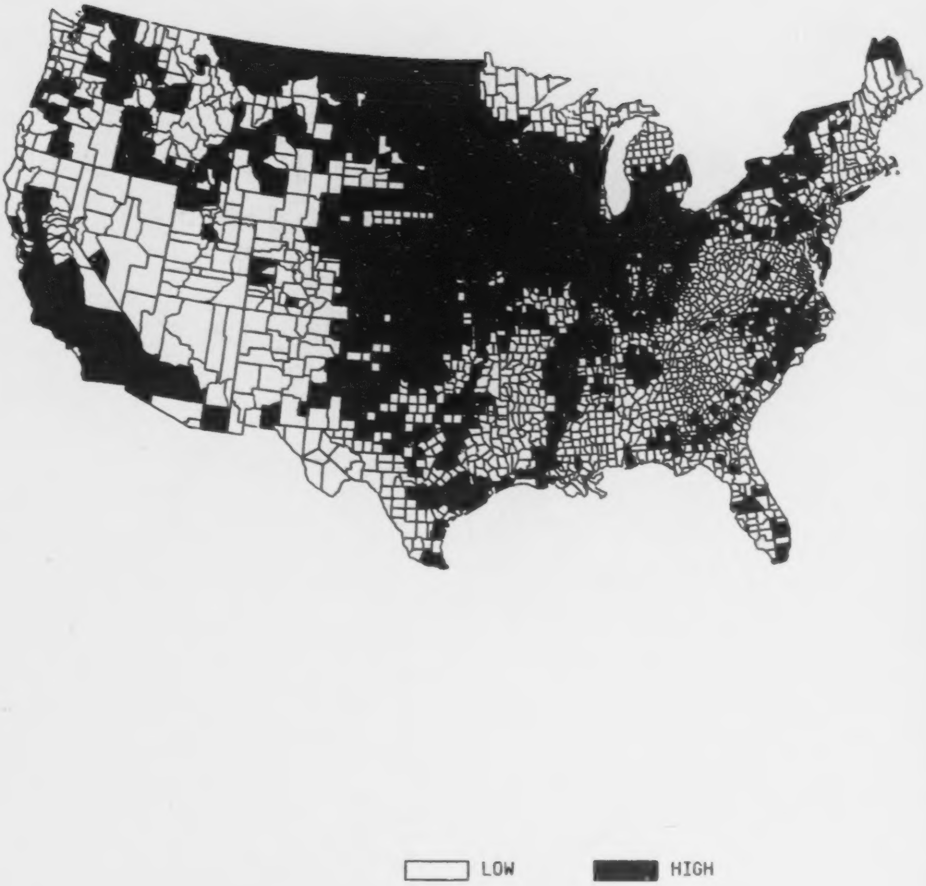
These findings suggest the need for agricultural policies which are regionalized to fit the structural profile or types of agriculture found in various types of farming areas. Index scores derived from the respective structural dimensions may be used in comparative descriptions of agricultural structure across States or regions, to help establish trends of structural change over time, and in modeling relationships with causes and effects of the different dimensions of agricultural structure.

The use of such indexes should be superior to analyses which just use single indicators of structure such as acreage or gross sales. Improved measurement should help bring better explanations and predictions from scientific circles which, in turn, may lead to more effective agricultural policies in the political and public arenas.



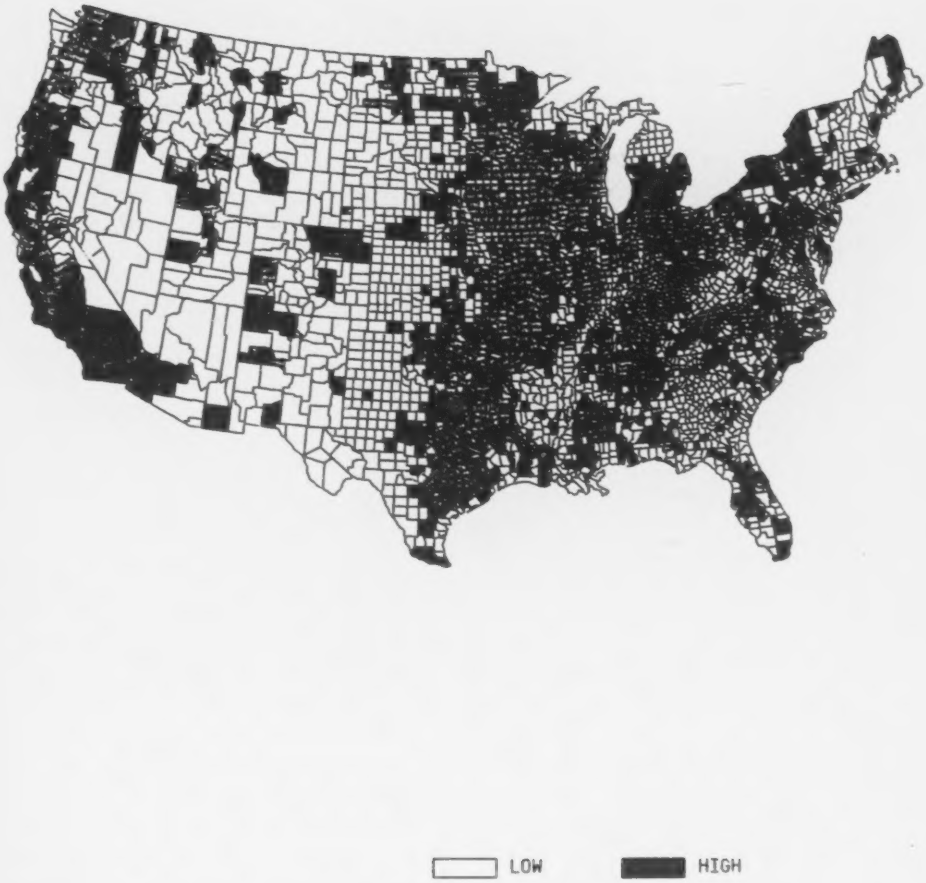
CORPORATE FARM STRUCTURE

MAP I



LARGE FARM STRUCTURE

MAP II



SMALL FAMILY FARM STRUCTURE

MAP III

SOME SPECIAL TRENDS IN AGRICULTURAL STRUCTURE

Trends in the three structural dimensions of agriculture are yet to be established through comparable analysis at additional Census periods. General trends toward fewer farms and, overall, toward farms of larger average acreages already are well known. Also, there are documented projections of a bimodal farm size distribution where there will be many small farms with little national economic clout at one end of the size distribution and a few large acreage farms with substantial commercial output at the other end of the spectrum.

Small farms

The survival of large farms, no doubt, will continue to be of importance for consumers. But perhaps the value of smaller farms is not as well recognized as is deserved. Smaller farm operations may seem of little economic importance in contrast to earlier times when proportionately more families were dependent upon subsistence farming. Today, however, small farms may hold potentials which are overlooked for household consumption, for offsetting or supplementing family income, for local market needs, for decreasing the need for income transfer payments, or for other functions. Therefore, such trends in small-scale farming in local areas deserve serious attention. Viable small farms may help contribute to the solution of many other types of policy pressures.

Part-time farming

Another special trend in our nation's agriculture is part-time farming. The occurrence of part-time farming has been an historic transformation of how farms socially organize to produce food and fiber. Part-time farming is an inherently more complex form of organization than many full-time farming operations. Part-timers must coordinate more diverse types of activities and resources. According to the latest Census figures, nearly one-half of the U.S. farm operators report their principal occupation as something other than farming.

The emergence of part-time farming since 1929 has been a profound social change in the structure of agriculture. Then, only one of eight farmers worked as much as 100 days a year off their farms. Since then, this measure of part-time farming has shown an almost persistent increase with each Agricultural Census. Now, more than four of each ten farmers report 100 or more days of off-farm work.

It is a mistake to assume that part-time farming is merely small-scale. It is prevalent in farms of larger commercial and acreage levels as well. Farm policies which fail to account for part-time farms will be incomplete.

ISSUES FOR THE 1980'S

While this brief review has looked mainly at structural conditions in agriculture per se, little has been said about the causes and effects of structural variation in agriculture. Such probable causes and consequences are vast and it will not be attempted to cover them here. As previously noted, a condensed review of the causes and effects examined by the S–148 project are provided in the Appendix.

Another primary source of information on agriculturally related social conditions is a book produced by the Rural Sociological Society on *Rural Society in the U.S.: Issues for the 1980s.*[1] It is especially suited to the concerns of this Committee. It contains several dozen chapters on the state of knowledge in as many topics and is written by researchers specializing in those areas.

One of these chapters is by William D. Heffernan, also a member of the S–148 research team, who summarizes much of what is known and what needs to be learned about agricultural structure's impacts on communities and rural areas. That chapter, along with many others in this volume, their authors, and the editors are recommended as further resources to this Committee.

SOME FUTURE RESEARCH DIRECTIONS

The work began in the S–148 project is to be advanced in a new Cooperative Regional Project, S–198, on "Socioeconomic Dimensions of Technological Change, Natural Resource Use, and Agricultural Structure." At present, 23 sociologists and economists from 15 of the 1865 and 1890 Land Grant Universities in 12 southern and midwestern States plus Puerto Rico are involved.

The objectives of this new project take up where S–148 left off:

1. To assess the relationships between farm structure and uses of natural and other resources.
2. To examine the structure of farms and related agribusiness industries and implications for regional agriculture.
3. To determine the relationship between selected emerging technologies and the organization of agriculture.
4. To analyze perceptions of agriculture held by farmers and nonfarmers.

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[1] See Dillman, Don A. and Daryl J. Hobbs, eds. "*Rural Society in the U.S.: Issues for the 1980's*," Boulder, CO: Westview Press, 1982.

APPENDIX: REVIEW OF OBJECTIVES, FINDINGS, AND AREAS OF CONTINUING INVESTIGATION FROM HATCH REGIONAL PROJECT S-148, "THE CHANGING STRUCTURE OF AGRICULTURE: CAUSES, CONSEQUENCES, AND POLICY IMPLICATIONS"

This Appendix on regional Project S-148 findings and areas of continuing investigation is extracted from a successor Regional Project Proposal, "Socioeconomic Dimensions of Technological Change, Natural Resource Use and Agricultural Structure," by many of the researchers who participated in S-148. The section of the proposal partially reproduced in this Appendix was drafted primarily by Professor C. Milton Coughenour of the University of Kentucky.

I. To identify and measure characteristics of farms and related activities as organization units.

1. Farm entry. Eighty percent of U.S. farmers in the early 1960s were sons of farmers. This percentage has remained stable during the succeeding two decades (Lyson, 1984) and even higher rates prevail in the South, e.g., Kentucky (Coughenour et al., 1983) and Oklahoma (Sanford et al.,1983). The particular contribution of farm background to farm entry has been thought to be primarily in terms of occupational socialization and access to farmland and other capital resources. S-148 studies have helped clarify the nature of this contribution. Farm background is more important for full-time than part-time farmers (Sanford et al., 1983). The socialization experience, including technical skill and commitment to farming, makes a greater contribution than access to farmland resources (Sanford et al., 1983; see also Lyson, 1984; Molnar and Dunkelberger, 1981). Parental assistance may be important in other ways. Parental resources are reflected in size of farm of beginning farmers and in the amount of the son's education. Both factors contribute to farm growth. In the opinion of Alabama farmers (Molnar, 1982), financing, land and management in that order are the principal problems of beginning farmers. In this respect, farmers perhaps underestimate the value of the contribution of their own prior experience. Lyson (1982b) concludes that background or prior socialization is a more important determinant of high school aged youths' farm occupation than their own occupational plans at that age.

Although greater insight has been gained into problems of beginning farmers, many aspects of the access to resources and the process of transfer remain to be worked out.

2. Operators characteristics and attitudes. Sample surveys were conducted in Alabama, Kentucky and South Carolina. Area surveys were made in Florida, Oklahoma, Iowa, Tennessee and Texas. Selected types of producers were studied in Louisiana. Census reports for 1969, 1974 and 1978 indicate a gradual decline in the age of farm operators which reflects the disappearance of the older cohort of farm operators who remained on small farms during the fifties and sixties. Sample survey data from Kentucky in 1979 and 1982 suggest the trend to younger farm operators is continuing

(Coughenour et al., 1980; Coughenour et al., 1983). The trend is bolstered by the retention of younger farmers made possible by off farm sources of income. Younger cohorts of farmers also have increasing amounts of schooling.

Farmers, which were once considered to be homogeneous in their sociopolitical outlook have become quite diverse (Coughenour and Christenson, 1983A; Russell et al., 1983; Molnar, 1982). The differences in policy preferences relate to age and education as well as size of farm operated and type of off farm occupation. The evidence suggests a significant self interest orientation in policy outlook which is associated with socioeconomic status.

3. Farm organization. In much of the literature, farm organization has been regarded primarily from production and managerial decision making standpoints. S-148 researchers, among others, have contributed to further investigation of these and other dimensions of farm organization. Studies were carried out at several levels of analysis. Coughenour (1984) summarized results of studies of farming as an occupation. Historically, the status and role of the farmer has changed from that of an husbandman with little separation of farm and household to an occupational role with sharp distinction between farm and family norms and activities. This differentiation is reflected too in values and farm goals.

Other studies point up the importance of considering differences in types of farms based on operator's age and farm/off farm employment (Tweeten, Cilley and Popoola, 1980) and the labor role of husband and wife (Coughenour and Swanson, 1983; Lyson, 1983; Molnar and Smith, 1983). The former classification results in a threefold classification of farms: aged/disabled , part time, and full time. The classification emphasizes aspects of labor and management of the operator which are linked with life cycle and off farm work. The second classification emphasizes ties with the nonfarm economy of the adult family members, the labor, farm management and family goals linked with off farm occupations. The household rather than the farm is the basic unit of analysis. Although both classifications represent advances over earlier ones, both need further methodological refinements and testing of their explanatory and predictive validities. Research indicates that the proportion of all farms operated as full-time family farms (not aged or disabled) is steadily declining at the same time that such farms are tending to become larger businesses (Coughenour et al., 1983; Tweeten, 1983).

Using Census of Agriculture data, Wimberley (1983b) has used factor-analysis to identify structural dimensions of U.S. farms. The procedure identifies clusters of farm structure variables at the county level. Three dimensions appear in 1974 and 1978: corporate/commercial farms, larger family farms and smaller family farms. Southern agriculture is a mixture of these types with corporate/commercial farms predominating in coastal plains of the Carolinas, South Florida, Mississippi Delta, and the Texas-Louisiana coastal areas. Larger family farms are in the same areas except South Florida and most other areas of the South have smaller family farms. Such descriptions have utility for targeting agricultural programs. Further analysis of stability of the dimensions over time and relation of the variables to resource use, family income and other variables is needed.

Considerable attention has been given to part-time and small farms. Based on research during the fifties and early sixties, it was assumed that part-time farming was primarily a way out of farming and that off-farm employment of farmers was principally by farm men. Studies by S-148 researchers, however, have demonstrated that families in which farming is only one of the economic activities are an increasing proportion of all families with farms. Commitment to farming is strong (Coughenour and Wimberley, 1982; Coughenour et al., 1983; Lyson et al., 1983; Molnar and Smith, 1983; Wimberley, 1983a). Not only are the patterns of farm/nonfarm careers persistent, but also multiple employment is as often a way into as out of farming. Also, young families with off-farm employment more often seek to expand than to contract farming operations (Lyson et al., 1983; Molnar and Smith, 1983). Due to the cross-sectional nature of these surveys, the important relationships between farm goals and development has not been studied carefully.

The off-farm employment of women is rising as is the employment of women generally. However, the involvement of farm women in farming has been more fully explored by others than by researchers in the S-148 project. This is a glaring weakness.

Related to the work roles of farm men and women are their decision making responsibilities. In the early 1970's much attention also was given to the loss of decision making responsibility through vertical integration. Jenkins and Heffernan have studied poultry producers in Louisiana and the changes occurring during the past decade (manuscript not available). Otherwise, S-148 researchers have largely neglected these important issues. For the majority of Alabama (Molnar, 1982) and South Carolina (Lyson et al., 1983) farmers, "being one's own boss" is regarded as a highly important aspect of farming. Any reduction would diminish satisfaction.

The composition of the farm work force has changed substantially during the last half century (Coughenour, 1984). In particular, unpaid family labor has declined dramatically and has been replaced proportionately (not numerically) by wage labor. Farm managers and farm foremen have increased both numerically and proportionately.

4. Farm activities. Productive enterprises of farmers vary by type of farm. Part-time farmers in particular tend to select less labor intensive enterprises which are appropriate to the particular area (Molnar, 1983; Wimberley, 1983A). Labor is a well recognized constraint for part time farmers, but why farmers adopt different strategies in managing that constraint has not been adequately explored. Lyson et al. (1983) report that small-sized farms in South Carolina more often than larger ones specialize in livestock while larger operators more often specialize in crop production.

The decision making factors and processes in the selection of farm enterprises have been explored by Heffernan and Jenkins (Louisiana) (manuscript not available). Coughenour (Kentucky) has data on farm enterprise combinations on Kentucky farms which has not been analyzed.

The utilization of recommended technology in agriculture has been a problem of interest for many decades. Even so, there are a number of unresolved issues including the relation between the extent of commitment to a particular farm enterprise and the adoption of technology, and the adoption of certain types of resource saving--soil, water, energy--technologies. These issues have not been explored much by S-148 researchers. Lyson et al. (1983) report variation in adoption of various practices by size of farm and area. Coughenour and Ladewig have unanalyzed data for Kentucky and Texas, respectively, on utilization of soil and water technologies.

5. Off-farm occupational relationships. By contrast with earlier decades when most part-time farmers held blue collar jobs, the off-farm occupations of farm men and women were through the occupational and industry structure (Coughenour et al., 1980, 1983; Lyson et al., 1983; Molnar and Smith, 1983). It seems clear that multiple income streams for families minimizes income risk, increases income (compared with farming alone) and investment and enhances personal well-being. Most part-time farmers regard the off-farm job as less desirable than farming in most respects except income (Coughenour, et al., 1983). A majority would rather farm, but realities compel continued off-farm employment especially for farm men (Molnar and Smith, 1983). Wimberley (1983A) has dealt in broad perspective with part time farming as a social form of agriculture, but there is need for much further work. For example, although most part time farms are small, a significant proportion are large (Molnar and Smith, 1983; Wimberley, 1983A). Information about the labor and management organization of these farms is quite fragmentary.

II. Assess the impacts that external variations in society, economic and institutional factors have on farms of various sizes and types

The industrialization of agriculture has increased the complexity of the interchange with American society (Ladewig and Albrecht, 1983). Research accomplishments and unresolved problems are summarized under the following: technology, national economic growth, off-farm occupation and income, market conditions and public programs and policies.

1. Technology. A majority of farmers in Alabama and South Carolina regard the costs of fuel, new machinery, money, labor and land as hindrances to future survival and growth of their farms (Lyson et al., 1983; Molnar, 1982) but consider that their ability to understand new technology helps or aids future survival. Small sized and large sized farmers in South Carolina as well as Alabama held similar attitudes with respect to the negative effects of cost factors on future survival. Farmers in both states, however, differed in their attitudes regarding the ability to understand new technology with small sized operators least often being confident of their ability in this respect. Analysis of the Alabama data indicates that this is related to education as well as possibly a lack of commitment to farming. It is probable that it also relates to prior socialization experience, but this has not been explored.

Economic analyses continue to show that small sized farms are less efficient than larger ones in the use of resources and that most economies of size can be realized on units operated by one family with minimal hired labor (Tweeten, 1983). At this time an economic unit needs to have assets of 1.0 to 1.5 million dollars and annual sales of $100,000 to $150,000. The vast bulk of U.S. farms are smaller and most farms will likely continue to be less than optimally efficient. Tweeten (1983) argues that such farms will continue to disappear, many exist to provide utility rather than profit (a position bolstered by attitudes of a sample of Kentucky farmers, Coughenour et al., 1983), and tax advantages and public subsidies to rural services. Although small sized farms may be economically inefficient, they may be socially efficient in the sense of families making rational choices in the use of their resources to increase utility.

The relatively high proportion of small farmers who lack contact with sources of technical information, including the Cooperative Extension Service, has been often noted. Russell et al. (1983) indicate this applies especially to the aged/disabled and/or small scale operators. For both groups unrelated farmers and friends were the information sources most often mentioned. However, the extension agent was the source that was next most often contacted. The credibility and helpfulness of the extension agent may be greater than might be assumed from the degree of utilization. In South Carolina over three-fourths of the small farmers who are not retired and two-thirds of the retired farmers consider the advice of the extension agent helpful (Lyson et al., 1983). Low motivation to seek professional advice is a constraint to the development of greater technical competence.

2. National economic growth. In order for farm income to keep pace with nonfarm income in an economy with rising income levels, farms must get larger. During the 1950's and 1960's, the annual rate of farm enlargement to keep up with nonfarm income growth was 1.3 percent and 3.0 percent, respectively (Tweeten, 1983). The impact of technology increases the required rate of increase in farm size while the availability of a nonfarm income supplement decreases the required rate. If the growth in the nonfarm economy slows during the 1980s, as expected, the annual rate of farm enlargement might rise (Tweeten, 1983.) Further research is needed, of course, to check these projections.

3. Off farm occupation and income. One effect of national economic growth is the growth of off farm job opportunities for farm men and women. By providing a stable or larger family income, investment and non-economic rewards, many small farm units continue to operate (Molnar, 1983; Tweeten, 1983). An off farm job results in greater ownership of farm land (Sanford et al., 1983), and the size of farm is related to the type of occupation (Coughenour and Swanson, 1983) with the income and managerial skills associated with off farm occupations making the greatest contributions. For women, the income but not education associated with the occupation is significantly related to farm size (Coughenour and Swanson, 1983). How the effects of income and skill are channeled through labor and decision making roles into the farming operations, however, has not been determined.

4. Market conditions. The expansion of international trade in certain farm commodities has provided both greater farm income and insta-

bility of farm prices. A majority of Alabama and South Carolina farmers believe, however, that greater foreign demand will help farmers (Lyson et al., 1983; Molnar, 1982). Small-sized farmers in both states, however, are less often confident of this than larger farmers. In reviewing the evidence of market price effects on farm size, Tweeten (1983) concludes that sustained periods of favorable farm prices (relative to costs) encourage farm enlargement while price instability tends more often to favor both large and small farmers compared with those in the middle of the size range.

With respect to the effects of market concentration, most Kentucky farmers perceive a lack of competition in the input markets and think that larger producers get the best prices (Coughenour et al., 1983). Tweeten (1983) concludes, after reviewing the research on market concentration and farm size, that the influence is not well understood but probably weak. The influence of market concentration on broiler producers is the only area investigated systematically by S-148 researchers, but the results of this research is not yet available. This is a high priority area for further research.

5. Public programs and policies. S-148 researchers explored farmers perceptions and opinions regarding the role of government commodity programs. Most Kentucky farmers believe that commodity supports have encouraged farm enlargement and that larger operators get the largest quotas, but most do not support limiting the size of production quotas or designing commodity programs to favor small scale farmers (Coughenour et al., 1983). Small producers more often supported programs favoring small producers than did larger producers. The effects of the many government policies and programs have been much debated, but the net effect probably has been almost neutral (Tweeten, 1983).

Alabama and Kentucky farmers recognize the advantages of governmental tax policies and believe larger operators benefit most (Coughenour et al., 1983; Molnar, 1982). The real effects are more complex. By contrast to the conclusions of other analysts in earlier years, Tweeten (1983) concludes that the net effect of all governmental taxes on the growth of farms has been relatively minor compared with other factors although elimination of investment credits, depreciation allowances, interest payment write-offs and a more progressive income tax rate structure would have a larger impact on farm structure.

In contrast to mainland farmers, Puerto Rican farmers did not think farm development was being hindered by lack of credit (compare Droz, 1984 and Molnar, 1982). Most farmers in both Alabama and South Carolina think interest rates are too high and hinder future development (Lyson et al., 1983; Molnar, 1982). Tweeten (1983), however, concludes that the ready availability of farm credit at low rates of interest probably has speeded the expansion of farms.

In general, farmers opinions regarding farm policies often reflect their self interest as related to farm size. This raises important issues regarding the spokesmen for farm interests. The actual effects of policies perhaps have been less than earlier claimed. But, continued analyses are needed to measure the effects of policies and farmers policy perspectives.

III. Assess the impact of organizational characteristics on career commitment and well being of individuals and families on farms.

Research on this objective has two aims: the impact of farm structure on individual and family well-being and the commitment of farmers to enter or to continue in farming.

1. Quality of life. Prior to research conducted under S-148 information on the quality of farm life was derived entirely from objective indices. These indices invariably showed substantial low income and levels of living among small full time farmers, and, prior to recognition of the contribution of off farm income, part time farmers also were thought to have low incomes and levels of living. While some accordingly thought the outlook of persons on small farms was characterized by hopelessness, despair and widespread dissatisfaction, critics of American commercial agriculture and the trend to large farms argued conversely that small scale farming provided a high quality of life.

As already noted, research indicated that the family income position of many on small farms was not as bad as had been feared due to off farm sources of income. Moreover, research data from Kentucky and Oklahoma farmers have shown that the subjective quality of life (satisfaction) of people living on farms is relatively high (Coughenour and Christenson, 1983A; Coughenour et al., 1983; Rogers and Tweeten, 1983). Subjective quality of life of farm families is higher than of persons living in cities or in rural nonfarm areas (Coughenour and Christenson, 1983A).

Levels of subjective satisfaction tend to increase with stage in the life cycle (Molnar, 1983) and to be higher for white than minority operators (Rogers and Tweeten, 1983). This suggests that the quality of life is highest among those living on viable family sized commercial farms. This conclusion is consistent with farmers opinions regarding the desirability of farm work and farm goals. At the same time, the conclusion does not support the critics' argument that small farms are especially notable for the higher quality of life provided (Tweeten, 1983).

Rogers and Tweeten (1983) found that part time farmers in Oklahoma rated their subjective quality of life higher than did either the aged/retired or full time farmers. Coughenour and Christenson (1983A) however, did not find significant differences between part time and full time (less than age 65) farmers in subjective quality of life. Thus, the generality of the effect of these structural factors on subjective quality of life is in question.

The modeling of individual and structural effects on the subjective quality of life has neglected attitudes of farm women, fails to explain much of the variance in the data anu has limited generality although the results are generally consistent with data from some national surveys.

2. Commitment to farm. With respect to the subjective commitment to farms, Molnar (1982) and Molnar and Smith (1983) conclude that it is higher among larger farmers and those farming full time. Family support is important in strengthening commitment to farm (Molnar, 1983). Responses of South Carolina farmers are consistent with the conclusion that subjective commitment to farming is higher for larger than smaller farm operators (Lyson et al., 1983). The fact that the level of satisfaction (quality of life) of smaller operators is somewhat lower than for larger ones is consistent with less commitment to farming by smaller farm operators.

The level of commitment is a relative matter. Droz (1984) indicates that Puerto Rican farmers are committed to farming. Russell et al. (1983) indicate that part time farming is viewed as a relatively permanent status by a majority of such farmers. Molnar and Smith (1983) point out that farm families with both adults working off the farm are most likely to be planning farm expansion which seems inconsistent with a weak commitment to farming. Wimberley (1983a) also points out that the tendency to favor farming over off farm work, and to continue part time farming over many years reflects substantial commitment to farming although perhaps less than for full time farmers. It is evident that further analysis of data is needed to reach more definite conclusions regarding the effects of farm structure on subjective commitment to farm and on behavior.

IV. Assess the development of farm sizes and types as related to population change, patterns of man-land relationships and community structure.

During the 1970s much concern was expressed about the adverse consequences of the changing structure of agriculture, notably the expansion of farm size, for the viability of rural communities. The effects of changing agricultural structures on communities might be manifested in weaker attachment to the community, less involvement in local community affairs and the declining purchase of goods and services as found by Goldschmidt.

The concerns about community impacts of the changing structure of agriculture gained urgency due to national trends showing declines in farms and farm population, increased farm size, tenancy and absentee ownership, corporate farms and the like. But, as Zachetmayr et al. (1983) point out such trends do not apply equally to all areas and consequently the impacts, if any, may vary on a regional basis.

1. Community attachment. Other research raises serious questions about the extent and nature of impacts, at least on mid-western communities, resulting from changes in the structure of agriculture. While Haas and Korsching (1983) confirm that community attachment is highly important in the purchase location of goods and services, community attachment is not related to farm size in acres or off farm employment and only weakly related to volume of farm sales. These results were consistent with earlier Missouri research (Heffernan et al., 1981) which indicated that there was little or no important difference (when length of residence was controlled) in the community attachment, support of community goals, reasons for rural living or purchase location of goods and services.

2. Purchase location of goods and services. In the most extensive analysis of the effects of farm size and tenancy of purchase location of farm inputs and consumer goods, Korsching (1984A) found only a positive relationship between the tenancy rate in an area and the size and distance of trade centers where farm inputs were purchased. Consequently, Korsching concludes that the Goldschmidt thesis probably does not apply to the midwest. Unfortunately, the Tennessee and Florida data which bear on these issues have not been analyzed.

Missing from the results of the research reported is an examination of the consequences of structural change in agriculture on retailers' location decisions and viability. Where farmers go for goods and services may be less important to community viability than retailers decisions on where there are sufficient customers and demand for their services. It may be that farm customers differ little in the type of service desired, but communities may change due to differences among communities in providing desired goods and services.

3. Social strata. Older research, while noting homogeneity of social status of farm families in the mid-west, emphasized the existence of differences in prestige or social standing and wealth. In the South large and small farmers, black and white, were separated by substantial differences in social status, power and prestige. The changing structure of agriculture has further separated small and large full time farmers in wealth and income. The growing relative numbers of part time farmers represented an anomaly. What social status did they have? Coughenour and Christenson (1983B) argue that the principal determinant is the nature--blue collar/white collar--of off farm employment. Differences in income, education, social values and policy outlook support this hypothesis. This means that one impact of a changing agriculture structure is the development of a social class structure of farmers that parallels American society generally. However, there is much controversy about the nature of social class and other research is needed to explore and clarify this issue.

As agriculture has become more commercialized, it has taken on more of the characteristics of nonfarm industries, including greater differentiation and complexity of work roles. One of the issues this raises is whether the various agriculturally related occupations are arranged hierarchially, like the rungs of a ladder, or are arranged in parallel ladders. Lyson (1982a) argues that there are three ladders (situses categories) of agriculturally related occupations due to different organizational contexts of the technical division of labor--production agriculture, agribusiness and agriculture education/research. Each of these situs categories of occupations has a distinctive social makeup with respect to factors that affect earnings and prestige. Race and sex, for example, are much more important determinants of earnings of production agriculture than of agriculture education/research workers. This provides a beginning, as Lyson notes, for further examination of the composition and change of the agricultural labor force and labor market behavior.

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THE EMERGENCE OF PART-TIME FARMING AS A SOCIAL FORM OF AGRICULTURE

Ronald C. Wimberley

I. INTRODUCTION

Farms—there were over 2.7 million of them in the United States as of 1978.[1] If the nostalgic American gothic image is that these are family farms which are worked from dawn to twilight by the operator, spouse, and offspring, this picture is inaccurate for many reasons. One is that many farms are not full-time businesses.

In 1978, 1.3 million or 49% percent of all farms were operated by persons whose principal occupation was, in fact, not farming but something else. Furthermore, 57% of all farm operators worked off their farms to some extent during the year; 46% worked elsewhere at least 100 days.

In other words, practically one-half of the nation's farmers are actually doing something else much or even most of the time. And regardless of whether they call themselves farmers, over one-half work at jobs besides farming. In short, it

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is part-time rather than full-time farming which is becoming the prevalent form of farm operation in this country.

This study will offer some descriptive information on part-time farming along with information on who these farmers are, where they are, what they do, some contemporary trends in part-time farming, and some issues involved. In addition, part-time farming will be viewed from the wider context of structural changes in American agriculture. Information and analyses on these topics are limited. Therefore, many of the data reported here are drawn from the censuses of agriculture. The focus of this review is to summarize recent findings which call attention to part-time farming and some of its implications for further phases of research and theoretical explanation.

Outside of the limited amount of agricultural research on part-time farming, there has been relatively little empirical or theoretical work on the sociology of agricultural occupations or agriculture in general. For the few dozen sociologists of agriculture, the subdiscipline is typically a part-time career in itself. Such sociological neglect of agriculture seems ironic since the existence of social order, major cultural components, and so much social interaction and organization pertain to the production, distribution, and consumption of food and fiber.

II. OVERLAPPING TYPES OF FARMS: FAMILY, SMALL, AND PART-TIME

Part-time farming is one of many types that are not mutually exclusive. It must be considered in conjunction with several other kinds of farming.

A. Family Farms

Among these is the so-called family farm. Although difficult to define, the notion of family farming is deeply ingrained in American history and has political appeal. This is seen in recent congressional statements including *Status of the Family Farm* (U.S. Senate, 1979), *Status of the Family Farm: Second Annual Report to the Congress* (Economics, Statistics, and Cooperatives Service, 1979), and *Status of the Family Farm: Third Annual Report to the Congress* (Economics, Statistics, and Cooperatives Service, forthcoming). Nevertheless, the ambiguity of what is or is not a family farm hinders use of the concept in research.

In one study, Nikolitch (1972:1-2) examined the family farm, like any other family business, as "a primarily agricultural business in which the operator is a risk-taking manager, who with his family does most of the managerial activities." This definition was operationalized to be those farms using "less than 1.5 years of hired labor because it is assumed that the American family farm supplies 1.5 man-years of labor." While 1.5 work-year equivalents is somewhat arbitrary, such a measure is workable for analytic purposes.

Some family farms are part-time, others are full-time. During the 1960s, part-time family farms were thought to be on the increase. Nikolitch (1972:26-27) took small farms having annual sales of less than $5,000 to be "mainly family operations" and measured part-time status in terms of off-farm income. He found that off-farm incomes rose from 69% of the total in 1960 to 84% in 1969 according to adjusted census data. Therefore, part-time farming would seem to account for a large share of the small-family farm activity.

This type of analysis illustrates the problem of overlap in organizational forms of farming. While family farms, small farms, and part-time farms may be distinguished conceptually, they are empirically interrelated.

B. Small Farms

Arbitrariness in measurement also characterizes research on small farms. Usually a gross annual sales level is the size criterion. For example, small farms commonly are judged to be those with annual sales less than $20,000-$40,000. Agricultural census reports distinguish whether farms sell more or less than $2,500 worth of goods annually. In the preceding example, Nikolitch used a $5,000 limit.

Acreage provides another means of slicing small from larger farm groupings. Fifty acres or less is often one limit, but there is nothing inherently meaningful about any particular acreage designation. A 50-acre wheat farm may be relatively small whereas the same size for a poultry farm would be quite large.

Gross sales are similarly deceptive. A farm earning as much as 10 percent profit on sales of $20,000 clears only $2,000. Such is the nature of most small-farm classifications.

A more recent approach to defining small farms was offered by the U.S. Department of Agriculture (USDA): "All farm families (a) whose family income from all sources (farm and nonfarm) is below the median nonmetropolitan income of the state, (b) who depend on farming for a significant though not necessarily a majority of their income, and (c) whose family members provide most of the labor and management" (USDA, 1979:39; Carlin and Crecink, 1979:933).

It is apparent that this definition would not include all small farms, for it selects those families having incomes in the lower half of the nonmetro families in a state. It includes neither all part-time farms nor all family farms. Like many other definitions, however, it does incorporate small farms with family and part-time farms.

C. Part-Time and Multiple-Career Farms

Perhaps one reason that part-time farming is so vaguely conceptualized is that it is so seldom studied apart from agricultural census data. Therefore, census definitions tend to be the most typically used. In the 1974 Census of Agriculture and again in 1978, three types of census items were directed toward part-time farming.

The primary indicator in the short and long census forms was "At what occupation did the operator spend the majority (50 percent or more) of his work time in [year]?" Responses were "farming" and "other." Operationalized in this manner, " part-time" farms are those operated by persons having a principal occupation other than farming. Those farms operated by persons principally, although not necessarily exclusively, employed as farmers are declared to be "primary farms" (U.S. Department of Commerce, 1977a:A-10). Second, and in the short census form, it was asked what "number of days operator worked off this place in 1974." Responses were "none, 1-49 days, 50-99 days, 100-149 days, 150-199 days, and 200 days or more." The long form inquired, "How many days did each member of the family work OFF the place in 1974?" and used the above response list for the operator or senior partner, spouse, and two other persons (U.S. Department of Commerce, 1977a:C-20). In the 1978 census the question was specified to ask, "How many days did the operator (senior partner or person in charge) work at least 4 hours per day OFF this place in 1978?" The final item was whether off-farm income for the operator and family was greater than that from the year's farm sales.

The census does not distinguish between *seasonal* part-time farming, as might be performed by those growing crops, and that which takes a daily share of one's work activities, as for farmers who tend livestock. This distinction may be crucial for the type of nonfarm employment a part-timer can take.

The issue of family, or at least household, farming enters the definition of part-time farming in another important way. This is in the case where one spouse, or adult household member, operates the farm on a full-time basis and the other may work as much as full-time off the farm. From the perspective of the household, this too is part-time farming; from the perspective of the individual, full-time farm operator, it is not. For such a mix of on- and off-farm labor in the household, this type of part-time farming might be regarded as dual- or multiple-career farming (Coughenour and Wimberley, 1982). Few data exist on multiple-career farming.

Some of the definitional issues on the interrelationships of family, small, and part-time farms will be reflected in the following review of descriptive statistics on part-time farming.

III. A STATISTICAL DESCRIPTION OF PART-TIME FARMING IN THE UNITED STATES

As noted earlier, farmers are now about evenly divided into groups of those who are principally farmers and those who spend at least half their work time as something else. This national pattern of principal occupations among farm operators holds fairly well across all regions of the United States except in the South (see Table 1) where over half are engaged primarily in off-farm occupations and where these "farmers" are most likely to have any or as many as 100 days of

Table 1. Principal Occupations and Days Worked Off Farms for U.S. Farm Operators in 1978 by Regions[a]

	United States (adjusted for undercounts)[b]	*United States (unadjusted)*	*North Central (unadjusted)*	*Southern (unadjusted)*	*Western (unadjusted)*	*Northeastern (unadjusted)*
Total N of farms	2,700,554	2,479,866	1,027,319	1,016,070	287,092	149,385
(row percentages)		(100.0)	(41.4)	(41.0)	(11.6)	(6.0)
Principal occupation of operator as percent of United States or regional N						
Farming	51	54	63	44	52	53
Other occupations	49	47	37	56	48	47
Days of off-farm work by operator during year						
Any days	57	55	50	60	57	55
≥ 100 days	46	44	38	50	47	45

Notes: [a]North Central = Ill., Ind., Iowa, Kan., Mich., Minn., Mo., Neb., N.D., Ohio, S.D., Wisc.

South = Ala., Ark., Del., D.C., Fla., Ga., Ky., La., Md., Miss., N.C., Okla., S.C., Tenn., Tex., Va., W.Va.

West = Ak., Ariz., Calif., Col., Hi., Idaho, Mont., Nev., N. Mex., Ore., Utah, Wash., Wy.

Northeast = Conn., Me., Mass., N.H., N.J., N.Y., Penn., R.I., Vt.

[b]This column of the U.S. totals is adjusted for undercounts reported in the 1978 preliminary census data as reported in other regional and national totals and as shown in the remaining columns of this table. The adjusted U.S. total includes the unadjusted U.S. total collected by mail plus supplementary data from personal canvasing of an area segments sample.

Source: U. S. Dept. of Commerce, 1978 Census of Agriculture: Preliminary Report off-farm work. By contrast, nearly two-thirds of the farm operators in the North Central region are principally farmers and barely one-half worked away from their farms at all during 1978.

One reason for these interregional variations is that small farms are proportionately most likely to be found in the South and least in the Midwest. And it is the small farms that are most often part-time. For the nation in 1978, for example, 78% of the operators having farm sales of less than $2,500 were principally in other occupations as compared to only 37% of those with farm sales of higher amounts (U.S. Department of Commerce, 1980a, calculations from adjusted totals).

A. Trends

1. *Principal Occupations*

Farm operators devoting at least half-time to other jobs have increased from approximately 37% in 1974 to the 1978 adjusted and unadjusted agricultural census estimates which run 10%-12% higher. Even with an undercount bias against smaller farms in 1974, this measure reveals a substantial increase in part-time farming in this recent and relatively short period.

2. *Off-Farm Workdays*

For agricultural census questions on days of off-farm work by the operator, increases in part-time farming can be traced further back. Table 2 shows trends from 1929, when the question was first asked, through 1978. The percentage working any days off the farm was fairly stable until 1949 when, perhaps, many operators returning from World War II discovered that supplementary off-farm jobs were needed. Since 1949, the rise in the percentage of farm operators doing off-farm work has continued. It passed the 50% mark in 1969 and reached 57% in 1978.

The percentage working away from away from their farms as much as 200 days per year—the full-time equivalent of as much as 40 or more 40-hour weeks—has risen throughout the period to around one-third of all operators. One hundred or more off-farm workdays has shown a similar increase, to nearly 50% of farmers by 1978.

In general, there has been a long-term and fairly steady trend for the nation's farmers to become part-time in character. This is an historic change in the social organization of farming. Along with the short-term trend toward principal occupations other than farming, these findings suggest that part-time farming is not only well established but is a continually emerging form of farm operation.

Table 2. Off-farm Work by U.S. Farm Operators, 1929-1978

Days of off-farm work	*1978*[a]	*1974*[b]	*1969*	*1964*	*1959*	*1954*	*1949*	*1944*	*1939*	*1934*	*1929*
None or not reporting	43	56	46	54	55	55	61	73	71	70	70
≥ 1 day	57	44	54	46	45	45	39	27	29	31	30
≥ 100 days	46	35	40	32	30	28	24	18	16	11	12
≥ 200 days	NA[c]	29	32	26	24	22	18	14	9	6	6

Notes: [a] Calculation on adjusted base of 2,700,554 farms.

[b] In 1974 there was an undercount of small farms which would tend to be part-time and therefore cause the percentages working off-farm to be lower than the true values. The unadjusted base is 2,279,270.

[c] Not available.

Source: U. S. Dept. of Commerce, *1964 Census of Agriculture*, Vol. II, Chap. 5:518; *1974 Census of Agriculture*, Vol. II, Pt. 3:43: *1978 Census of Agriculture: Preliminary Report*, U. S..

B. Comparisons of Part-Time and Other Farms

As the preceding tables indicate, most descriptive material on part-time farr ing in the United States comes from the census of agriculture which was taken five-year intervals until those of 1974 and 1978. Currently, only the prelimina summary data are available for the 1978 census. The only 1978 cross-classificatio which involve principal occupations and days of off-farm work are for farr selling less or more than $2,500 per year. However, the final reports of the 197 census do provide more detailed information.

Agricultural census data, and especially those of 1974, are not without drav backs. In the first place, the definition of a farm that was initiated in 197 excludes any having less than $1,000 in annual sales. The definition used fror 1959 to 1969 includes places of 10 acres or more which sold at least $50 a year c produce or farms selling at least $250 worth regardless of size. The result of th definition change is that the 1974 and 1978 censuses omit places that might b considered farms but which sell less than the $1,000 threshold used by th Department of Commerce, which conducts the census. Granted, the total amoun of farm product sales from such small farms is trivial. Yet, there may be som commercially undeveloped food and fiber potential for these very small farms and, perhaps more importantly, they produce quantities of food and fiber that ar consumed rather than sold. These operations are farming activities, part of th nation's agriculture, and of possible significance for domestic needs. Farm production indexes show that home consumption of crops as well as animal products has reversed a decline measured since 1940 and has been increasing since the early 1970s (Economics, Statistics, and Cooperatives Service, 1979:50).

Omissions of farms due to the change in farm definition are evident in census tables showing that over 152,000 farms in 1974 and at least 470,000 farms in 1978 would have been added had the previous definition been used (U.S. Department of Commerce, November 1980:4,8).

A second drawback is that in 1974 census there was an unusual extent of undercounting. This was associated with the first use of mail questionnaires. Recent estimates (U.S. Department of Commerce, 1980c) put the undercount at 10.7% overall, 4.7% for farms selling at least $2,500, and 25.9% for the smaller farms of $1,000-$2,500 in sales.

Third, the census does not obtain as many social data on farm operators or their households from farms expected to sell less than $2,500 as from farms with higher expected sales. Omitted from the short form on smaller farms, for example, is the information on off-farm income by other family members.

For the purposes at hand, the omission of so many small farms works against an accurate portrayal of part-time farms as well. This bias makes 1974 census reports a conservative estimate of part-time farming and underrepresents part-time farming in comparison to principal farming operations.

There is a fourth limitation to the use of agricultural census comparison of part-time versus other farms. However, this disadvantage serves to counter the $1,000 sales requirement of the farm definition and is not so affected by the undercount in 1974. Still it is a disadvantage for an accurate and total description. It is this: published cross-classifications obscure part-time farming comparisons across all farms and are directly reported only for those farms of $2,500 or more in sales. As noted here, these data offer a conservative picture of the extent of part-time farming since so many small part-time farms do not have this level of sales. On the other hand, the data on farms of $2,500 or more in sales offer the best cross-classifications readily available.

Table 3 contrasts farm operators who are principally employed as farmers (primary farmers) with those who spend over half of their annual work time in other occupations (part-time farmers). Although the primary farm operators may be considered as full-time, it should be recalled that many of them have off-farm workdays as well.

1. *Age and Race*

It is observed that part-time farmers are somewhat younger than primary farmers. There are essentially no racial differences between part-time and primary farmers; both are overwhelmingly white.

2. *Off-farm Income*

Fifty-eight percent of the part-time operators have nonfarm incomes surpassing their farm earnings. Part-time farm families have relatively higher mean nonfarm incomes by a difference of over $8,000 although the mean number of off-farm workers per farm is the same on primary and part-time farms. However, members of part-time farm operator families are more likely to have worked off the farm at all and for as many as 100 or more days.

3. *Scale of Farming*

The average size of part-time farms is 297 acres, but this is still 150 acres lower than that of primary farms. Concomitantly, small farms of less than 50 acres are proportionately over twice as numerous among part-time farmers. Whereas the average real estate value of part-time farms is nearly one-half that of primary farms, part-time farm sales average only one-third as much as primary farm sales.

4. *Commodities Produced*

Part-time farmers are relatively more involved with beef cattle and horses. Primary farms tend to be more concerned with dairy cattle, swine, and egg production. The only crops with which part-time farms have proportionately greater involvement are orchards and tobacco. Primary farms tend to dominate production of corn, soybeans, wheat, cotton, hay, and vegetables.

Table 3. A Comparison of Full- and Part-Time Farms with Sales of $2,500 or More in 1974

	Principal Occupation of Operator		
	Farming (Primary farms)	*Other (Part-time farms)*	*Total*
Total farms with ≥ $2,500 sales			
N	1,235,852	426,690	1,662,542
(row percentage)	(74)	(26)	(100)
Mean age	52.4	48.3	51.4
Percent white	98	98	98
Mean family off-farm income	$5,876	$14,229	$9,136
Family members other than operator working off-farm			
Off-farm workers per farm	1.2	1.2	1.2
Percent farms with off-farm workdays	14	24	16
Percent farms with ≥ 100 off-farm workdays	11	23	14
Mean farm acreage	547	297	483
Percent of farms of < 50 acres	10	24	13
Value of sales per farm	$47,786	$15,684	$39,547
Commodities produced:			
Percent farms with livestock			
Cattle and calves	65	61	64
Beef cows	42	47	43
Milk cows	23	10	20
Hogs and pigs	24	18	23
Sheep and lambs	5	5	5
Horses and ponies	12	19	14
Laying hens	12	10	12
Broilers	2	2	2
Percent farms with crops			
Field corn	56	37	51
Soybeans	33	24	31
Wheat	33	21	30
Cotton	5	3	5
Tobacco	9	10	9
Irish potatoes	2	2	2
Hay	56	46	54
Vegetables	4	3	3
Orchards	3	6	4
Percent farms with contract labor	43	34	40
Percent farms with hired labor	6	6	6

Source: U. S. Dept of Commerce, *1974 Census of Agriculture*, Vol. I, Part 51, Table 29. Some means and percentages reported here were derived from the base data in the census.

5. *Contract and Hired Labor*

While over one-third of the part-time farms use contract labor, they are somewhat less likely to do so than are primary farms. Contract labor is needed for such jobs as pesticide and fertilizer applications. The use of hired labor is essentially the same for both types of farms.

IV. FURTHER CHARACTERISTICS AND SOCIAL CONDITIONS PERTAINING TO PART-TIME FARMERS

While such data as the above are available from the agricultural census on part-time farm operations, further information on part-time farming as an occupation is found in several research reports and through Department of Agriculture statistics. Prior to the 1970s there were some analyses by sociologists and economists. The primary focus was upon part-time farming as an exit from or entry into full-time farming. These studies and typologies are treated in a useful review by Bertrand (1967). In the last few years, however, there seems to be a resurgence of research and interest in part-time and multiple-career farmers and their households. Current topics include off-farm occupations and social status, amounts and sources of off-farm income, rural industrialization and reverse migration, quality-of-life and community relationships, household features, and the previous concern for part-time farming as an entry, exit, or stable career pattern for farm operators.

A. Off-Farm Occupations and Status

What is the nature of the other careers of part-time farmers and multiple-career farm households? Needs for this information have been stressed in recent statements on part-time farming (Carlin and Ghelfi, 1979:273; Coughenour and Wimberley, 1981).

In a 1979 survey of registered voters in Kentucky, Coughenour, et al. (1980) selected about 1,100 farmers from a larger sample of respondents and looked at their off-farm employment. These farmers were classified into part-time (44%), dual-career (14%), and full-time (42%) types. Since the researchers used the $1,000 sales threshold, the farmer subsample could be compared to the 1978 Census of Agriculture findings. On similar indicators, a good fit was found between the state sample and the 1978 census results. As was the case nationally, part-time farmers dominated the state's agriculture.

Off-farm occupations for part-time farmers and for the spouses of operators on multiple-career farms were found to range widely and were similar to the distribution of nonfarm occupations in Kentucky's total labor force. In general, the nonfarm jobs of part-time male farmers were 38% white-collar and 62% blue-collar. The respective percentages for the state as a whole were 43% and 57%. For female spouses of multiple-career farm families, 63% were white-collar versus 36% blue-collar, in line with the 68%-32% breakdown for the entire state (Table 4). Therefore, male part-time farmers and spouses on multiple-career farms are slightly less likely to be in white-collar occupations and correspondingly more likely to have blue-collar positions than the general population of this state.

Elsewhere, Coughenour (1980a) reports that part-time farmers in this Kentucky sample were also more likely than other workers to be in the transportation and communications industries (15% versus 9%) and finance/insurance/real estate businesses (5% versus 3%), but less likely to engage in mining (4% versus 6%) and the manufacture of durables (14% versus 11%). Furthermore, part-time farmers in blue-collar nonfarm careers tended to farm less than 100 acres in contrast to white-collar operators who were inclined to operate larger acreages. Off-farm jobs in durable goods manufacturing were associated with part-time farms of less than 50 acres. Part-time farms of 180 acres and larger were most strongly associated with business and professional services and with wholesale and retail trade.

Certainly the sample of Kentucky farmers or those of any other single state cannot be considered to fairly represent the nation. On the other hand, these

Table 4. Off-Farm Occupations of Part-Time and Multiple-Career Farm Families in Kentucky, 1979

Off-farm occupations	*Percent male part-time farmers*		*Percent working wives in multiple-career families*		*Percent multiple-career husbands on farm*
Professionals	10		19		
Managers and proprietors	19		7		
		38 Percent		63 Percent	
Clerical	4		31		
Sales	5		6		
Craftspersons	13		1		
Operatives	23		8		
		62 Percent		36 Percent	
Service workers	6		11		
Laborers	20		16		
Farm	(all)		(None)		93
	100 percent		100 percent		

Source: Coughenour, Stockham, and Christenson, 1980:3.

results cannot be considered entirely atypical. They at least suggest, first, that there is a wide range of complementary off-farm career types for farm commodities produced in the state and, second, that the distribution of these occupational categories is quite similar for multiple-career or part-time farm families and the general population. In addition, the Kentucky research found that off-farm work does enhance family economic well-being.

B. Off-Farm Income

For a farmer or spouse to be employed off the farm is one thing. The amount—large or small—of off-farm income is another matter. Furthermore, farming might be part-time in the sense that it is not the sole source of income whether or not it is the sole source of employment.

1. *Amounts*

The median 1979 family incomes for the Kentucky farmers were highest for part-time operators ($19,162), although these farms were smallest in terms of sales. Second-ranked were multiple-career family incomes ($15,771), although they had the highest farm sales. The lowest family incomes were for full-time farmers ($10,338) (Coughenour et al., 1980).

In the aggregate, off-farm income in the United States is observed to play a major, if not principal, role in the total family incomes of farm operators (Table 5). While gross family incomes have quite steadily increased from $39 billion to $126 billion in 1978, net farm income has also increased from $12 billion in 1969 to $34 billion in 1978 but at an erratic rate (Economics, Statistics, and Cooperatives Service, 1979:31). This means that the total income of farm operations has also gone up and down, but mostly up from $20 billion in 1960 to $62 billion in 1978. However, variations in these trends are not due to advances and declines in the off-farm incomes. Indeed, off-farm income rose steadily throughout this period, from $8 billion in 1960 to $34 billion in 1978. Whereas the ratio of 1978 to 1960 was 3.2:1 for gross farm income, 2.4:1 for net income, and 3.1:1 for total farm income, these differences were exceeded by a 4:1 ratio of increase in off-farm income.

Since 1964, at least 50% of total farm family income has been from off-farm sources. The only exception was in 1973 when net farm income was at a record high. The all-time high for off-farm income was 62% in 1976 and 1977.

As an alternative to the national aggregate amounts, Figure 1 charts the average farm and nonfarm income for farms of all reported levels of sales in 1978 (USDA, 1981:45). Despite the unequal intervals of the sales classes, it is apparent that, as total farm family income goes up, farm income increases but nonfarm income decreases. This inverse relationship also raises several questions concerning the role of off-farm income. Is it earned to supplement the farm income? Or, is the farm income sought in order to supplement the off-farm resources? In

Table 5. Aggregate U.S. Farm and Off-Farm Income for Farm Operator Families (Rounded to Billions of Dollars)

Year	*Gross farm income*	*Net farm income*	*Off-farm family income*	*Total of net and off-farm family income*	*Off-farm as as percent of total*
1960	$ 39 billion	$12 billion	$ 8 billion	$20 billion	42 percent
1961	41	12	9	21	43
1962	42	12	10	22	45
1963	43	12	11	23	48
1964	42	10	12	22	53
1965	47	13	13	26	50
1966	50	14	14	28	50
1967	51	12	15	27	54
1968	52	12	15	28	56
1969	56	14	17	31	54
1970	59	14	17	32	55
1971	62	15	19	33	56
1972	71	19	21	39	53
1973	99	33	24	57	42
1974	98	26	27	53	50
1975	100	24	27	52	53
1976	102	19	30	49	62
1977	109	20	32	52	62
1978	126	28	34	62	55

Source: Economics, Statistics and Cooperatives Service, U. S. Dept. of Agriculture. *Farm Income Statistics.* Stat. Bulletin No. 627 (October 1979): 31.

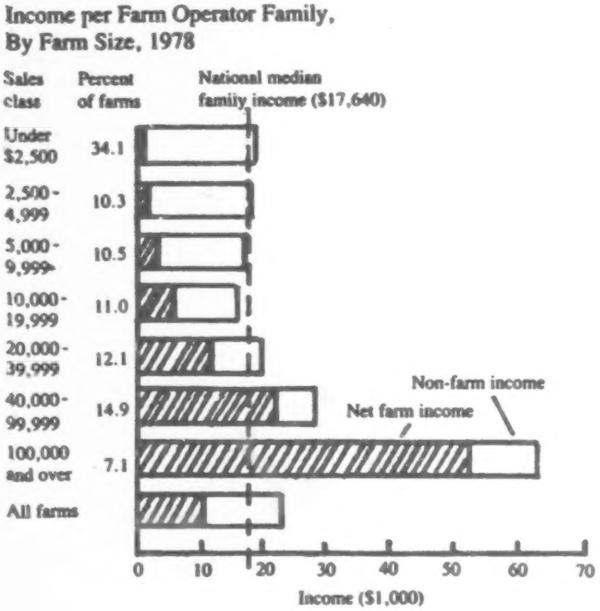
other words, which is the stronger career commitment of these part-time and multiple-career farm households? Which would they give up if they could?

Perhaps some of the answers are linked with the type of commodity the farm produces. Research by Coughenour (1980b) indicates that those who raise beef cattle seem more strongly committed to farming than those who raise hogs, grains, or tobacco. This does not mean, however, that producers of any particular commodity would necessarily terminate their farm operations in favor of nonfarm careers.

Another response to such questions may lie in the level of total farm family incomes. For example, households at the lower income levels would appear to be in greater need of off-farm resources; those with higher family incomes could get along without the small portion of off-farm income they obtain. But again, would the higher-income households prefer to earn more from the farm if they could? The reasons for farming could be more diverse than reasons for working away from the farm. If so, there is probably no single answer to questions of the relative strength of farm career commitments for part-time farmers and multiple-career farm households.

If the lags in total family income for farms in the $5,000-$19,999 sales

Figure 1. On- and Off-Farm Income per Farm Operator Family by Farm Sales categories, 1978.



Source: Economics and Statistics Service, USDA and as presented by USDA (1981):45

categories (Figure 1) are an indication, there must be some dilemmas in combining farm and nonfarm careers. For these sales categories in particular and for whatever reasons, the interaction effect of farm and nonfarm careers seems negative on total income per family.

In essence, data on aggregate and average farm/nonfarm incomes show that off-farm sources have come to dominate the incomes of farm families. From the standpoint of farm families, part-time and multiple-career farming seem to be interlocked with other sources of income.

2. *Sources*

The five categories of off-farm income used by the agricultural census are shown in Table 6 with the 1974 per-farm mean averages for operations selling at least $2,500 of products. Highest is income from nonfarm businesses. This average is followed by salaried employment and at a distance by pensions, rentals, and returns from investments. By far the most important source of income for the most farms is the 60% reported from off-farm employment other than businesses. Nonfarm businesses are somewhat more lucrative on the average but account for just 20% of the off-farm receipts. The remaining sources from such things as interest, social security, and rents amount to another 20%. These data indicate that, in terms of income, part-time or multiple-career farming may occur to an appreciable extent in the absence of employment at nonfarm business or salaried jobs.

Table 6. Sources of Off-Farm Income for U.S. Farms Selling $2,500 or More, 1974

Sources	*Mean per farm*	*Percent of total per source*
Nonfarm businesses	$10,455	20
Wages, salaries, commissions, tips	8,836	60
Interest, dividends, royalties	2,507	12
Social Security, pensions, retirement, etc.	2,852	6
Rental of nonfarm property	2,651	2
Total per farm =	$ 9,136 (972,121 farms)	100 percent ($8,882 million)

Source: U.S. Dept. of Commerce, *1974 Census of Agriculture*, Vol. I, Part 51. Table 16, p. I-14. Percentages calculated from reported data.

C. Part-Time Farming, Rural Industrialization, and the Reverse Migration

The relationship of farm to nonfarm employment by part-time farmers or multiple-career households is also an issue in rural industrialization. Rural industrialization has an intuitive policy appeal for improving employment, income, and living conditions in rural areas and has been advocated for these purposes. Not only should there be direct benefits from new jobs, but there should be multiplier effects on other types of jobs and on the local economy at large.

It has been thought that low-income farmers could gain industrial employment that would enable them to cease farming or, if they wished, could continue to work their farms on a part-time or multiple-career basis. Rural industrialization has probably served this purpose for some and helped to prevent a degree of rural-to-urban migration from both farm and nonfarm rural residents. Moreover, in what appears to be a major reversal in this migration pattern, the United States nonmetropolitan population began to increase at a higher rate than that in metropolitan areas during the 1970s (Brown and Wardwell, 1980; *Social Science Quarterly*, 1980). Some of this is attributed to the decentralization of industries into rural areas, In addition, moves by retirees, the expansion of colleges and universities in rural areas, and rural recreational developments have contributed to the reverse migration (Beale, 1975).

Firms moving into rural and farming regions often bring many employees from the outside rather than drawing extensively upon the indigenous population (Summers, 1982). On the other hand, it is not characteristic of industries to relocate in rural areas in order to pay higher wages to local people or higher taxes to local communities. Therefore, the existing commitments of farmers to that career may be to the advantage of off-farm employers in several ways. First, farmers can afford to work for low wages since they already have another source of income. Second, many of the farmers are committed to their farms and may not want to move away from their property for jobs. Third, they may also be required to share the burden of increased taxes needed to serve the larger industrial work force.

Besides off-farm employment possibilities which might serve to enhance the transition toward part-time and multiple-career farming, part-time farming may increase in relation to the influx of migrants. First, those retirees who stay or relocate in sparsely populated areas may choose to do some farming as a pastime or as an additional source of income. Second, some people who move into rural areas for jobs in industries, to schools, to other service jobs, or to recreational communities may likewise enter part-time farming for pleasure if not business.

D. Part-Time Farming and the Community

On the one hand, nonfarm jobs may help to retain farm residents in a locality and, on the other, they may become alternative careers for those who move into farming regions. In either event, the number of part-time farms households may grow. Their continued and increased existence in and around small communities and outside major metropolitan areas may have effects beyond the farm households themselves.

In a comparison of part-time and full-time farmers in south-central Missouri, Heffernan and Green (1980) found similarities on most measures of community integration, community goals, and reasons for living in rural communities. The mild-to-moderate differences that were observed occurred primarily among those farmers who had lived in the communities less than seven years. Such variations as were found may have been largely attributable to the facts that the part-time farmers were younger, better educated, and of higher incomes. The study did not compare full-time, part-time, and nonfarm residents to see which kind of farmers most resembled the nonfarm population or to determine whether the presence of either mode of farming mattered in the social conditions of the area.

Findings by Coughenour and Christenson (1980) on the sample of Kentucky residents found that full-time, part-time, and multiple-career farmers were also quite alike in personal and community satisfaction. In combination, however, all three types of farmers were more satisfied than nonfarm residents of the state.

Therefore, what is known about the impact of part-time farming in communities is sketchy. But if anything, it is speculated that recent migrants who are part-time farmers do differ from full-time farmers and that farmers in general may differ somewhat from nonfarmers. More information is needed before the community role of part-time and multiple-career farming can be adequately understood.

E. Part-time Farming and Household Characteristics

The literature reviewed here has not been found to contain reports of household or family characteristics for part-time and multiple-career farm units other than the occupational and income variables that have been discussed. It is unknown whether or how these families may differ from those of the full-time and nonfarm populations in size, marital status, extended family residence, fertility, or age-gender composition. Neither is it clear whether part-time or multiple-career farm households experience more or fewer interpersonal problems.

In addition, what should be the implications for changes in the number of these families for society? Are there advantages to raising children under these kinds of work arrangements? A 1981 tax break for children on farms may be an advantage that will encourage part-time and multiple-career farming (Economics and Statistics Service, 1981) as well as similar mixes of nonfarm employment and businesses.

F. Part-Time Farming as the Beginning, End, or Continuation of a Farm Career Commitment

Given a long-term decline in numbers of farms (Table 7), the shift toward part-time farming as measured by days worked off the farm (Table 2), and the recently documented trend toward principal occupations other than farming (Table 2), it would seem that part-time farming might represent a transition out of farming altogether. This was an implicit assumption in many earlier studies of part-time farming (e.g., Fuguitt, 1959; Bennett, 1967). Indeed, the trend which can be documented since the 1930s for many farm operators to work away from their farms (Table 7) corresponds to the national decline in the number of farms since their peak around 1920.

The exit function of part-time farming is perhaps best seen in a Canadian agricultural census panel analysis by Steeves (1979). He found that between 1966 and 1971 the percentage of operators who left farming increased steadily with the number of days worked off the farms in 1966. While 22% of those with just one to six off-farm workdays in 1966 had left farming by 1971, 46% of those who worked away for 229 or more days left during this period of only five years. This compares to 36% of all operators and 34% of the full-time farmers who quit. Part-time farmers exceeded this rate if they had worked at least 127 days off-farm during the base year. Therefore, it would seem that part-time farming does serve as a transitional phase out of farming for those who spend substantial proportions of their time doing other jobs.

On the other hand, part-time farming may be viewed as an entry to full-time farm careers. Steeves provides information on this aspect as well. As the number of off-farm workdays increased among those who did any farming during 1971, so did the percentage who started farming since 1966. While 19% of those working away only one to six days had begun farming during this span, 43% who worked away at least 229 days in 1971 were not farming at all in 1966. Overall, 24% of all farmers had taken full- or part-time farms since 1966 and 20% of the full-time farmers in 1971 were newcomers to the job.

Steeves concluded that off-farm labor provides an important two-way steppingstone for entering or leaving farming and that both farm and nonfarm labor markets are interdependent. While numerically there are fewer part-time farmers, calculations from the Canadian data suggest proportionately more stepping in than out. Whereas 27% of the 166,000 part-time farmers in 1966 had left this career by 1971, 46% of the 88,000 who entered farming by 1971 were doing so on a part-time basis.

Unfortunately, the U.S. Census of Agriculture does not lend itself to this type of panel analysis that is required to assess the extent to which part-time farming is the initial or terminal phase of farm careers. No doubt part-time farming in the United States serves both roles; and, no doubt, farming in certain regions of the United States may resemble that of Canada or of other industrialized societies. However, such data do not appear publicly available for a panel analysis of U.S. agriculture at this time.

For Kentucky, at least, Coughenour and Gabbard (1977) do find that in the early 1970s part-time farming seemed to have become more a path into farming than a way out and into other occupations. The evidence that part-time farmers are somewhat younger than full-timers (Table 3) further suggests this phenomenon.

Just as part-time farming would appear to serve as a point of both entry to and exit from farming, it must offer a third option: that of a relatively permanent career pattern combining farming with other forms of work and income. Again, national data are lacking to provide a picture of the relative stability of part-time farm careers. Rather, some information is available from state studies. For example, Coughenour and Gabbard (1977) discovered that part-time farmers in Kentucky had been so for over eight years. In Illinois, a study by Hanson and Spitze (as reported by Carlin and Ghelfi, 1979) found that only 6% of the part-time farmers anticipated a complete shift to off-farm jobs within five years. This leaves a sizable majority who plan to continue. A recent USDA review of several such studies surmises that many part-time farms are not transitional forms of farm operations nor are they economically stressed. It (USDA, 1981:38) concludes that "Part-time farming has apparently developed as a permanent institution, with a different character than the one attributed to it in years past." Thus, part-time farming is no longer to be considered merely as a halfway house for those operators leaving or entering farm careers.

V. STRUCTURAL CHANGES IN AGRICULTURE

A Social Structure:The Population, Farms and Farm Workers

The relationship between population size and the labor required to produce food and fiber has experienced a social transformation in this century. Several indicators of these changes are shown in Table 7. While the U.S. population has continued to increase, the number of farms and employment in farming have decreased.

1. *Population*

In 1920, when the United States population was about 106 million, the population living on farms was about 32 million, or 30% of the total. By 1979, the national population had more than doubled to 220 million. Conversely, the farm population had declined by 80% to around 6 million, or only 2.8% of the total population. This 2.8 percent represented one farm resident for every 35 citizens in the country.

2. *Farms*

As the population balance shifted from being predominantly rural in 1910 (54% rural) to more than one-half urban in 1920 (49% rural), the number of farms was at an all-time high at 6.5 million. But in 1978 there were only 2.7 million farms. During these 58 years, the average number of persons per farm had surged from 16 to 81—an increase of 506 percent!

3. *Farm Employment*

Simultaneously, farm employment dropped. It stood at about 12.5 million in 1930 but, according to various data sources, was only around 3.3-3.5 million by the end of the 1970s. Rather than one farm employee for every 10 people in 1930, there was one for about every 60 or more people in 1979.

Recorded data on those working for farm wages or salaries (Table 7) show their number to have been highest in 1950 and 1960 at 1.6 and 1.8 million, respectively, then declining in 1970 to 1.2 million and gradually rising to approximately 1.4 million by 1979.

If the information from the *1980 Handbook of Agricultural Charts* is used for a guide, only 2.5 million were family workers on farms in 1979. Another 1.3 million hired workers brings the farm labor force to 3.8 million. From 1970 to 1979, there was a decline of .8 million family workers and a gain of .1 million hired employees for a net loss of .7 million. Sixty-three percent of the farm workers were self-employed, as compared with 11% in other industries.

It is evident that drops in the farm labor force cannot continue to be anything near .7 million per decade for very much longer. The ratios of farm units per population may widen, but the trends in farm and farm population numbers may now continue to level off if not fluctuate.

4. *Part-Time Farm Work*

Still, this has been a dramatic shift in the social resources needed to meet the basic human requirements that farms and their workers produce. The output per worker is even more impressive when one considers that so many of the farm operators and employees work only part-time and/or on a seasonal basis. As noted earlier, 49% of the farm operators in 1978 had a principal occupation other than farming. A General Accounting Office report (1978:55) indicates that 2.8 million farm laborers in 1966 amounted to just 1.1 million full-time equivalent (FTE) positions. Therefore, the effective number of FTEs is only about 39% of the total positions. These workers plus the farm operators—of whom 49% are principally working as something other than farmers—are the core of the farming activity.

This puts the effective ratio of FTE farm workers to the dependent population at a much wider ratio of one position per 58 or so citizens estimated for 1979 in Table 7. An arbitrary and probably optimistically high estimate that 75 percent or 2.85 million of the 3.8 million farm positions are FTEs would make the ratio of farm workers to population about 1:77 or less.

Indexes of total farm output and of farm production per work hour may reflect the effort of the largely part-time and seasonal farm work force with greater sensitivity (Table 7). Both indexes are adjusted to 100 in 1967. The total output index gained 40 points from 1910 to 1954 and as much again by 1978. Hourly production rose about 90 points from 1910 to 1967 and has nearly doubled since that time. These indicators reflect the mechanization and associated technologies of the twentieth-century revolution in food and fiber production which has released people from the farm work required to meet the growing demand.

Regardless of the trends toward a smaller farm population and labor force, agriculture took a stronger role in the U.S. economy during the 1970s when farm exports not only exceeded imports but rose sharply from about $10 billion in 1970 to $35 billion in 1979. This has served to offset deficits in nonagricultural sectors and has helped to stabilized the national balance of trade (USDA, 1980:63). Of course, this does not directly indicate the success of part-time farmers since most of the exporting is probably from the larger, full-time, commercial farms.

B. Farm Structure: Size, Concentrations, and Organizational Complexity

Declines in the number of farms, farm population, and farm labor force along with the rise of agricultural productivity and a growing population of consumers are only several of the structural changes in American agriculture. Additional transformations include trends toward larger average acreages for the fewer

Table 7. Trends of Structural Change in U.S. Agriculture

Year	*1* U.S. population (1000s)	*2* Farm population (1000s)	*3* Farm population percent of U.S. total	*4* Number of farms (1000s)	*5* U.S. persons per farm	*6* Total farm employment (1000s)	*7* Farm wage & salary workers (1000s)	*8* U.S. persons per total farm employment	*9* Index of farm output 1967 = 100	*10* Index of farm production per work hour 1967 = 100
1850	23,192			1,449	16					
1880	50,189			4,009	13					
1900	76,212			5,737	13					
1910	92,228	32,077	34.8	6,362	14				43	13
1920	105,711	31,974	30.2	6,448	16				51	14
1930	122,755	30,529	24.9	6,289	20	12,497		9.8	52	16
1940	132,166	30,547	23.1	6,102	22	10,979		12.0	60	20
1950	151,326	23,048	15.2	5,388	28	9,926	1,630	15.2	74	34
1954				3,711	34	8,651			80	42
1960	179,323	15,635	8.7		48	7,057	1,762	25.4	91	65
1964				3,158	61	6,110			95	81
1969				2,730	74	4,596			102	110

1970	203,810	9,712	4.8			4,523	1,152	45.1	101	115
1971	206,219	9,425	4.6			4,436	1,161	46.5	110	128
1972	208,219	9,610	4.6			4,373	1,216	47.6	110	136
1973	209,859	9,472	4.5			4,337	1,254	48.4	112	130
1974	211,389	9,264	4.4	2,622[b]	81	4,389	1,349	48.2	106	136
1975	213,051	8,864	4.2			4,342	1,280	49.1	11[illegible]	152
1976	214,680	8,253	3.8			4,374	1,318	49.1	117	162
1977	216,400	7,806	3.6			4,155	1,330	52.1	121	173
1978	218,228	6,501[a]	3.0	2,701[b]	81	3,973	1,418	55.4	121	183
1979	220,099	6,241[a]	2.8			3,297	1,413	66.8		
1979[c]						3,467	1,506	63.5		
1979[d]						3.8 million	1.3 million	57.9		

Sources for columns of data:
1. USDA, *A Time to Choose* (1981):35.
2. *1959 Census of Agriculture*, for 1910 population; USDA, *A Time to Choose* (1981):35, for 1920-1979.
3. Calculated from cols. 1 and 2.
4. *Statistical Abstract of the United States*; 1926, for 1850-1900; various years for *Census of Agriculture*.
5. *1974 Census of Agriculture*, Vol. II, Pt. 1:15; *1978 Census of Agriculture: Preliminary Report*.
6. *Statistical Abstract of the United States*, 1979:681.
7. USDA, *A Time to Choose* (1981):35.
8. Calculated from cols. 1 and 6. See also source for cols. 9 and 10, page 57, for domestic and foreign persons supported.
9. Economics, Statistics and Cooperatives Service, *Changes in Farm Production and Efficiency, 1978*, Bulletin No. 628, 1980: 6-7.
10. Same as col. 9 source, p. 46.

Notes: [a] 1974 agricultural census definition of farm.

[b] Respectively adjusted for 1974 census undercount and for supplementary area sample count in 1978.

[c] U. S. Dept. of Commerce and USDA, *Current Population Reports. Farm Population of the United States: 1979*, Series P-27, No. 53 (1980):5.

[d] USDA, *1980 Handbook of Agricultural Charts*, Handbook No. 574 (1980):25.

remaining farms; the disappearance of middle-sized farms; specialization in technology; specialized labor; changing patterns of farm ownership; increased hired labor requirements; new forms of tenancy; increased energy and petroleum needs for fuels, fertilizers, and pesticides; new land-use patterns; the increased criticality of water; new contractual arrangements and vertical integration; plus other changes (Economics, Statistics, Cooperatives Service, 1979a, 1979b; General Accounting Office, 1978; U.S. Senate, 1979; Shertz et al., 1979; Lin, Coffman, and Penn, 1980; McDonald and Coffman, 1980). Several of these farm-level changes will be considered here with implications for part-time farming.

1. *Changes in Size*

Consider, for example, the opposite trends of decreases in numbers of farms and increases in their mean acreages. From a high of 6.5 million farms in 1920, the number has dropped to an unadjusted total of 2.5 million (an adjusted total of 2.7 million) in 1978 (Table 7 and U.S. Department of Commerce, 1977a; 1980a). Simultaneously, mean farm size rose from 175 acres in 1940 to 303 in 1959 and to an unadjusted high of 440 acres in 1974 (416 in 1978). In less than 40 years there has been a loss of 3.6 million farms, or a 59% decrease in numbers, with a corresponding increase of 138% or 241 acres in size.

The current sizes of these farms seem to be larger than household labor forces could typically operate. The larger ones appear to be corporate farms. Still, corporate farms may be held by families. In 1978, there were roughly eight family corporate farms for each one owned by unrelated persons (U.S. Department of Commerce, 1980).

2. *The Disappearance of Middle-Sized Farms*

To the extent that part-time farming is more characteristic of smaller farms, these structural trends suggest that the share of commercial output from part-time farms may likewise decline. However, the picture is not entirely a gloomy one for small farms. Their staying power—and that of the many part-time farms they coincidentally represent—seems more secure than that of moderate-sized operations although not necessarily as good as that for the larger-than-family-sized commercial operations.

This trend toward the disappearing middle of the farm size distribution is another vital structural change for small, family, and part-time farming. Harper et al. (1980) found that there had been an increase in farms of less than 50 acres between the 1969 and 1974 agricultural censuses for all regions except the South. In the North Central region, this was a reversal of a trend toward fewer such small farms from 1959 to 1964. All four regions showed appreciable declines in middle-sized farms of 50-999 acres from 1969 to 1974, while larger farms became more numerous everywhere except in the West.

Comparing preliminary 1978 agricultural census figures with those of 1974 indicates a similar national trend toward the disappearance of 50-499 acre farms whereas there are increases in farms either larger or smaller than this middle category. The pattern is especially prominent in the Midwest and is now becoming apparent in the South. It is not so clear in the Northeast and West. Yet, in all regions farms or less than 50 acres seem to be holding their own or better in numerical strength.

In gross sales, 1974 and 1978 census comparisons show national declines among farms selling $10,000-$39,999 worth of produce and increases among farms selling $2,500-$9,999 and $40,000 or more. The next couple of decades look much the same for the size distribution of farms according to their gross sales. Lin et al. (1980:10) state: "[T]he projections further reveal that future farm numbers are likely to follow a bimodal distribution—a large population of small farms, an ever increasing proportion of large farms, and a declining segment of medium size farms." As noted here for the 1974-1978 period, the middle group of farms with $10,000-$39,999 in sales is predicted to experience shrinkage.

3. *Concentration of Production*

Another example of structural change shows the concentration of production in fewer large, commercial farms. Similar statistics are offered by a variety of recent sources (General Accounting Office, 1978:57; Schertz, 1979:27, 41-42; Economics, Statistics, and Cooperatives Service, 1979a:52-54; Schertz et al., 1980:14-20; McDonald and Coffman, 1980:8-9; and Experiment Station Committee on Policy, 1981:3-6). In 1960, the 50,000 largest farms accounted for 23% of the sales; in 1967, they received 30%; by 1977, they claimed 36% of the sales (U.S. Senate, 1979:11). To put it another way, by the mid-1970s the largest 5% of the farms had 50% of the sales whereas the smallest 50% of the farms had only 5% of the sales (General Accounting Office, 1978:55-58)

No matter how it is said, the structural difference is that the bulk of the farms command only a small amount of commercial agriculture. The concentration of production is increasing among the few largest farms.

The projections are that this concentration will continue. While the largest 20% of the farms contributed 80% of the production in 1974, for example, by the year 2000 it is estimated that the largest 12% of the farms will produce 80% of sales. Or, the largest 1% of the farms in the year 2000 will furnish 50% of the agricultural goods whereas the smallest 50% will provide only 1% of the farm product (Lin et al., 1980:12; McDonald and Coffman, 1980:8-9).

4. *Land Concentration*

Although it is difficult to establish trends in farm and other types of land ownership (Lewis, 1980), some information over time is available on amounts of farmland operated by given numbers of farms (Lin et al., 1980:14). For example, 54% of the farmland was controlled by farms of more than 1,000 acres in 1969. This figure grew to 58% in 1974. By the year 2000, the nation's 1,000-acre farms are projected to control 71% of the land. As a second example of trends in farmland concentration, the largest 50,000 farms operated 30% of the land in 1969, 35% in 1974, and are projected to be operating 50% by the year 2000 although such farms should comprise just 3% of all farms at that time. In brief, trends are toward control of more farmland by fewer farms.

5. *The Role of Part-Time Farming in Structural Changes*

Although commercial production and land are becoming more concentrated in the very largest farms, small and primarily part-time farms seem to have a promising future. Indeed, it may be part-time farming that gives small farms their tenacity in the face of the large-farm concentrations. And since part-time farms are by no means all small, part-time farming might also significantly contribute to and grow in importance for the survival of the beleaguered farms in the middle categories of acreage and sales.

If part-time farming has now become the typical form of small, family farming, it should therefore become an even more common occupational mode in small-and medium-sized farming. Of course, the collective commercial impact of such farms is still likely to be insignificant in comparison to big agriculture. But while part-time farmers may find some economic rewards in terms of supplementary household incomes or for household consumption needs, the more important rewards may be social and psychological.

In any event, increases or decreases in part-time farming as an occupation could have marked effects on other kinds of structural conditions of agriculture including the farm population, the farm labor force, the total concentration of agricultural production in the hands of the few, the number of farms, and farm sizes, to say nothing of the impacts on underemployment, unemployment, the domestic and local food supplies, family food expenditures, and rural and community development.

6. *Organizational Complexity*

Using principal occupation other than farming and having more off- than on-farm income, an analysis of North Carolina census data on farm structure finds that part-time farming factors into a dimension with individual or family ownership of farms, operation by the full owner, off-farm residence, and farm indebtedness (Wimberley and Belyea, 1979). By its nature, a part-time farm has an added element of structure complexity. It has a division of labor, decision-making, and time use which any full-time organization does not have. This complexity exists at the level of a part-time operation and at the level of a multiple-career household. Likewise, an increased role complexity is the nature of a part-time farming career. For either the farm organization or the part-time career role, however, the complexity should not be considered necessarily as a disadvantage; the joining of farm and nonfarm components also serves to increase the external linkages and options for each. In the case of part-time farm operations and part-time farming careers, some of these options include a means of transforming one type of career into another. Furthermore, these advantages brought about by complementary part-time activities may provide a permanent arrangement for increasing income, a buffer against hard or uncertain times, the keeping of a preferred residential location, or the continuity of a lifestyle.

On the other hand, two or more occupational commitments may become interdependent social investments which restrict career or residential mobility whenever one of the career lines offers greater potential as a full-time career commitment.

VI. CONCLUSIONS

This paper has attempted merely to explore and to describe certain aspects of part-time farming as it is currently found in our society. The purpose has not been to analyze the data in the service of any preconceived theory. Rather, the intent has been to introduce a topic which deserves further empirical and theoretical attention. The hard analytic and explanatory insights are yet to be formulated.

Some of the findings summarized here are, first, that part-time farming has become a dominant force in this nation's agriculture during this century. This appears to be an historic transformation in how farm units are socially organized for the production of essential food and fiber needs.

Second, part-time farmers differ from other farmers in being somewhat younger, having farms of smaller acreage and real estate value, being less likely to use hired labor, and producing different types of commodities. However, full- and part-time farmers are similar in racial composition and in the use of contract labor. Data from one state suggest that part-time male farmers tend to be slightly more blue-collar in their off-farm jobs than are citizens in general. So are the female spouses on multiple-career farms. This plus other community characteristics suggest that part-time farmers and their households are integrated into their social surroundings.

Third, off-farm incomes have become increasingly significant for farm families. The dominant sources of off-farm income are employment and businesses, with interest income, pensions, and rents being lesser contributors.

Fourth, both private sector relocations of firms and the new patterns of nonmetropolitan migration are potential contributors to part-time farming activities. On the one hand, the labor resources of farmers might be an attraction for firms to relocate in farming areas and, in effect, tend to transform some into part-timers. On the other hand, the reverse migration may also serve to bring nonfarm people into part-time farming.

Fifth, part-time farming serves as a way into, as a way out of, and as a fairly stable career pattern of farm operation. Whereas in earlier decades from the 1930s into the 1960s part-time farming may have been predominantly an exit from farming altogether, it may now be proportionately more of a portal into farming on a full- or at least a stable part-time basis. However, conclusive panel data on the United States are lacking on these speculations.

Sixth, part-time farming may also play a role in structural changes in American agriculture by offsetting tendencies toward the concentration of farm sales, production, land, and other resources under the control of relatively few large farms, in certain forms of commodity production at least.

Furthermore, household consumption of farm products from part-time farming may be beginning quietly to offset some purchases of food among part-time and dual-career farm households.

Several areas of research on small and part-time farming have been summarized by Coughenour and Wimberley (1982) and are offered here with regard to part-time operations.

1. *Data needs.* Descriptive data are needed on part-time farmers whose operations are smaller than the census definition includes. A public-use sample of census data is needed to further analyze part-time farm units in addition to the county-level data usually available. Furthermore, national and regional panel data could help determine the entry, stability, and exit rates of part-time farmers.

2. *Opportunities and barriers.* In what ways does part-time farming create opportunities as well as barriers to the expansion of farming operations and to full-time nonfarm employment?

3. *Association for political and economic interests.* To what extent are part-time farmers willing to participate with others to further their political and economic interests?

4. *Social interactions with others.* How are part-time farm career patterns associated with the nature of off-farm career opportunities, personal and family rewards or costs, and the social structure of communities in which these households are found?

5. *Part-time farming in society.* What is the effect of part-time farming on the nature of the larger society? For example, how does this form of agriculture influence social and cultural change, population movement, industrialization and development, farm and nonfarm labor markets, energy use and supplies, conservation and the environment, the food supply, consumership, and lifestyles?

In addition to these areas are the impacts of part-time or multiple-career farming on structural changes in agriculture and vice versa. Among these is the role of part-time and multiple-career farming in the concentration of ownership, production, and control of land or other farming resources.

In general the sociology of food and agriculture may be a "black hole" of the sociological discipline. Just as the alleged gravity of black holes in space lets them emit no light which would call attention to them, the sociology of food and agriculture is also conspicuous for its absence. Unnoticed as it may be to sociologists, the need for food must be among the strongest of social gravities that enable society and culture to operate. It seems eerie that so little sociological research and theory is directed toward its understanding.

Among the prime prerequisites for the continued existence of social life are air, water, and food. The environmental movement has recently caught the attention of some social scientists and turned them to the study of natural resources. While some may assume that rural sociologists have been studying agriculture, this is rarely the case. Only in the past few years have even a minority of rural sociologists renewed interests in the sociology of agriculture. Yet the sociology of food and agriculture goes beyond the customary boundaries of rural sociology or any other of its subdisciplines.

Many sociologists have researched many types of organizations and many types of career patterns—often exotic organizations and deviant careers. Yet very seldom have farms been studied as complex organizations and rarely is farming studied as an occupation or career. And if the study of farms as organizations and the study of farming as an occupational career are in a relative void, so is the study of part-time farming. Such is the nature of black holes.

Large-scale agriculture is dependent upon fuels, fertilizers, chemicals, and the transportation of both farm supplies and products. With the coming of potential energy crises and increased demands for food, the emergence of part-time farming might lend some protection against vulnerabilities in the food chain for households and certain localities. However, to the extent that part-time farms are specialized in one or a few commodities, the potential security of part-time farming is limited. Also, acute energy and food crises—or genetic weaknesses of plant varieties and animal species, worsening environmental conditions, hired farm labor problems, increased costs of transport of commodities, and the like—may not allow time to develop part-time farm operations further in time to meet even minimal short-term food needs.

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NOTES

1. These figures are from the *1978 Census of Agriculture Preliminary Report* (U.S. Dept. of Commerce, 1980) and are adjusted for undercounts in the county totals. See Tables 1 and 2 for a summary of the statistics used in these introductory paragraphs.

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APPENDIX

CENSUS OF AGRICULTURE
1982
SUMMARY OF STATISTICS

TABLE 1 FARMS, LAND IN FARMS, AND LAND USE

		1982		1978			82/78	82/78
		Number	Percent	Number	Percent		Change	% Change
All Farms		2,241,124	100.0	2,257,775	100.0	-	16,651	- 0.7
Land in Farms (Acres,000)		984,755	100.0	1,014,777	100.0	-	30,022	- 3.0
Average Size of Farm		439		449		-	10	- 2.2
Value of Land and Buildings:								
Average per Farm	Dollars	347,974		279,672			68,302	+ 24.4
Average per Acre	Dollars	791		619			172	+ 27.8
Farms by Size (Acres):								
1 - 9		187,699	8.4	151,233	6.7	+	36,466	+ 24.1
10 - 49		449,301	20.0	391,554	17.3	+	57,747	+ 14.7
50 - 179		711,701	31.7	759,047	33.6	-	47,346	- 6.2
180 - 499		526,566	23.5	581,631	25.8	-	55,065	- 9.5
500 - 999		203,936	9.1	213,209	9.5	-	9,273	- 4.3
1000 - 1999		97,396	4.4	97,800	4.3	-	404	- 0.4
2000 +		64,525	2.9	63,301	2.8	+	1,224	+ 1.9
Land in Farms According to Use:								
Total Cropland	Farms	2,010,779	89.7	2,081,604	92.2	-	70,825	- 3.4
	Acres(000)	445,528	45.2	453,874	44.7	-	8,346	- 1.8
Harvested Cropland	Farms	1,809,901	80.8	1,904,602	84.4	-	94,701	- 5.0
	Acres(000)	326,312	33.1	317,146	31.3	+	9,166	+ 2.9
Cropland used only for Pasture or Grazing	Farms	869,809	38.8	949,206	42.0	-	79,397	- 8.4
	Acres(000)	65,070,141	6.6	73,204,828	7.2	-	8,134,687	- 11.1

Other Cropland	Farms	537,064	24.0	699,464	31.0	- 162,400	- 23.2
	Acres(000)	54,145,802	5.5	63,523,350	6.3	- 9,377,548	- 14.8
Woodland, including Woodland Pastured	Farms	917,141	40.9	939,563	41.6	- 22,422	- 2.4
	Acres(000)	87,133,026	8.9	91,815,487	9.0	- 4,682,461	- 5.1
Pastureland and Rangeland other than Cropland and Woodland	Farms	595,016	26.5	585,446	25.9	+ 9,570	+ 1.6
	Acres(000)	415,933	42.2	433,317	42.7	- 17,384	- 4.0
Land in House Lots, Ponds, Roads, Wasteland, etc.	Farms	1,496,824	66.7	1,478,319	65.5	+ 18,505	+ 1.3
	Acres(000)	36,161,228	3.7	35,770,928	3.5	+ 390,330	+ 1.1
Irrigated Land	Farms	278,368	5.0	280,779	5.0	- 2,411	- .86
	Acres(000)	49,014,423		50,349,906		- 1,335,483	- 2.7

TABLE 2 SELECTED SUMMARY ITEMS

Market Value of Agricultural Products Sold:	$1,000	131,810	107,073	+ 24,737	+ 23.1
Average per Farm	Dollars	58,815	47,424	+ 11,391	+ 24.0
Crops, including nursery and Greenhouse Products	$1,000	62,274,394	48,203,200	+ 14,071,194	+ 29.2
Grains	$1,000	36,405,401	26,747,307	+ 9,658,094	+ 36.1
Cotton and Cottonseed	$1,000	3,232,609	3,101,232	+ 131,377	+ 4.2
Tobacco	$1,000	2,782,111	2,319,428	+ 462,683	+ 19.9
Hay, Silage, and Field Seeds	$1,000	2,314,999	2,275,068	+ 39,931	+ 1.8
Vegetables, Sweet Corn, and Melons	$1,000	4,150,275	3,238,826	+ 911,449	+ 28.1
Fruits, Nuts, and Berries	$1,000	5,849,637	4,601,397	+ 1,248,240	+ 27.1
Nursery and Greenhouse Products	$1,000	3,823,663	2,835,732	+ 987,931	+ 34.8

TABLE 2		1982		1978		82/78	82/78
		Number	Percent	Number	Percent	Change	% Change
Other Crops	$1,000	3,715,699		3,084,210		+ 631,489	+ 20.5
Livestock, Poultry, and Their Products	$1,000	69,536,509		58,870,258		+ 10,666,251	+ 18.1
Poultry and Poultry Products	$1,000	9,732,222		8,463,486		+ 1,268,736	+ 14.9
Dairy Products	$1,000	16,322,513		11,228,899		+ 5,093,614	+ 45.4
Cattle and Calves	$1,000	31,579,973		29,610,751		+ 1,969,222	+ 6.7
Sheeps, Lambs, and Wool	$1,000	608,369		644,574		+ 36,205	+ 5.6
Hogs and Pigs	$1,000	9,872,193		8,071,766		+ 1,800,427	+ 22.3
Other Livestock and Livestock Products	$1,000	1,421,239		850,783		+ 570,456	+ 67.1
Farms by Value of Sales: ($000)							
Under - 5		814,897	36.4	762,047	33.7	+ 52,850	+ 6.9
5 - 10		281,895	12.6	314,245	13.9	- 32,350	- 10.3
10 - 20		259,258	11.4	299,421	13.3	- 40,163	- 13.4
20 - 40		249,063	11.1	299,398	13.3	- 50,335	- 16.8
40 - 100		333,047	14.9	360,423	16.0	- 27,376	- 9.1
100 - 250		216,188	9.7	165,791	7.3	+ 50,397	+ 30.4
250 +		86,775	3.9	56,450	2.5	+ 30,326	+ 53.7
Value of Agricultural Products Sold Directly to Individuals for Human Consumption	Farms	143,535		125,236		18,229	+ 14.6
	$1,000	504,272		380,827		123,445	+ 32.4
Farm-Related Income: Income from Machine Work, Customwork, and other Agricultural Services	Farms	165,424		222,212		56,788	- 25.5
	$1,000	687,589		637,667		49,922	+ 7.8

Farms by Type of Organization:							
Individual or Family		1,945,724		1,965,860		- 20,136	- 1.0
	Acres(000)	641,739		673,188		- 31,448	- 4.7
Partnership		223,339		232,538		- 9,199	- 4.0
	Acres(000)	151,343		158,078		- 6,736	- 4.3
Corporation:							
Family Held		52,657		44,413		+ 8,244	+ 18.6
	Acres(000)	112,492		102,002		+ 8,490	+ 8.2
Other than Family Held		7,131		5,818		+ 1,313	+ 22.6
	Acres(000)	13,992,416		16,118,159		- 2,125,743	- 13.2
Other-Cooperative, Estate or Trust, Institutional, etc.		12,273		9,146		- 3,127	- 34.2
	Acres(000)	65,188,746		63,390,805		- 1,797,941	- 2.8
Tenure of Operator:							
Full Owners	Farms	1,325,931	59.2	1,297,902	57.5	- 28,029	- 2.2
	Acres(000)	342,630		331,921		- 10,710	- 3.2
Part Owners	Farms	656,219	29.3	681,112	30.2	- 24,893	- 3.7
	Acres(000)	528,861		561,139		- 32,277	- 5.8
Owned Land in Farms	Acres(000)	260,169		281,452		- 21,284	- 7.6
Rented Land in Farms	Acres(000)	268,693		279,687		- 10,994	- 3.9
Tenants	Farms	258,974	11.6	278,761	12.3	- 19,787	- 7.1
	Acres(000)	113,264		121,718		- 8,454	- 7.0
Operators by Principal Occupation and Residence:							
Farming		1,234,858	55.1	1,269,305	56.2	- 34,447	- 2.7
Residence on Farm Operated		934,949	41.7	957,409	42.4	- 22,460	- 2.4
Residence not on Farm Operated		175,796	7.8	182,686	8.1	- 6,890	- 3.8
Other than Farming		1,006,266	44.9	988,470	43.7	+ 17,796	+ 1.8

TABLE 2		1982		1978		82/78	82/78
		Number	Percent	Number	Percent	Change	% Change
Residence on Farm Operated		646,312	28.8	628,275	27.8	+ 18,017	+ 2.9
Residence not on Farm Operated		253,575	11.3	239,104	10.6	+ 14,471	+ 6.1
Operators by Age Group:							
Under 25 Years		62,339	2.8	66,575	2.9	- 4,236	- 6.4
25 to 34 Years		293,856	13.1	285,420	12.6	+ 8,436	+ 3.0
35 to 44 Years		443,456	19.8	433,900	19.2	+ 9,556	+ 2.2
45 to 54 Years		505,445	22.5	549,159	24.3	- 43,714	- 8.0
55 to 64 Years		536,426	23.9	552,175	24.3	- 15,749	- 2.9
65 Years and Over		399,602	17.8	370,546	16.4	+ 29,056	+ 7.8
Average Age		50.5		50.3		+ .2	+ 0.4
Female Operators:							
Farms	Number	121,626		112,799		+ 8,827	+ 7.8
Land in Farms	Acres(000)	35,462,394		35,342,860		+ 119,534	+ 0.3
Operators by Race:							
White		2,186,755		2,199,787		+ 13,032	+ 0.6
Black and Other Races		54,369		57,988		+ 3,619	+ 6.2
Operators Reporting Days of Work Off Farm:							
Any		1,187,490		1,203,286		- 15,796	- 1.3
100 Days or More		963,728		950,815		+ 12,913	+ 1.4
Selected Farm Production Expenses:							
Livestock and Poultry Purchased	$1,000	17,110,899		16,039,244		+ 1,071,655	+ 6.7
Feed for Livestock and Poultry	$1,000	18,573,721		15,785,995		+ 2,787,726	+17.7
Commercially Mixed Formula	[illegible]	[illegible]					

Seeds, Bulbs, Plants, and Trees	$1,000	3,173,754	2,607,118	+ 566,636	+ 21.7
Commercial Fertilizer	$1,000	7,689,577	6,330,581	+ 1,358,996	+ 21.5
Other Agricultural Chemicals	$1,000	4,282,795	2,889,503	+ 1,393,292	+ 48.2
Hired Farm Labor	$1,000	8,434,399	6,814,428	+ 1,619,971	+ 23.8
Workers Working 150 Days or More	Farms	312,621	317,161	+ 4,540	+ 1.4
	Number	950,112	953,694	+ 3,582	+ 0.4
Contract Labor	$1,000	1,106,129	898,959	+ 207,170	+ 23.1
Customwork, Machine Hire, and Rental of Machinery and Equipment	$1,000	2,024,725	1,750,875	+ 273,850	+ 15.6
Energy and Petroleum Products	$1,000	9,973,663	6,025,704	+ 3,947,959	+ 65.5
Gasoline and Gasohol	$1,000	2,987,056	2,054,818	+ 932,238	+ 45.4
Diesel Fuel	$1,000	3,150,413	1,469,392	+ 1,681,021	+ 114.4
Electricity	$1,000	2,040,615	1,308,290	+ 732,325	+ 55.9
Interest Expense	$1,000	11,673,895	(NA)		
Machinery and Equipment:					
Estimated Market Value of all Machinery and Equipment	$1,000	93,686,308	77,600,689	+ 16,085,619	+ 20.7
Average per Farm	Dollars	41,930	34,471	+ 7,459	+ 21.6
Motortrucks, including pickups	Farms	1,914,124	1,907,021	+ 7,103	+ 0.4
	Number	3,435,299	3,357,829	+ 77,470	+ 2.3
Wheel Tractors	Farms	1,919,732	1,962,676	- 42,944	- 2.2
	Number	4,525,373	4,626,228	- 100,855	- 2.2

TABLE 2

		1982 Number	1982 Percent	1978 Number	1978 Percent	82/78 Change	82/78 % Change
Grain and Bean Combines, Self-Propelled Only	Farms	560,963		572,532		- 11,569	- 2.0

TABLE 3 LIVESTOCK AND POULTRY

		1982 Number	1982 Percent	1978 Number	1978 Percent	82/78 Change	82/78 % Change
Cattle and Calves Inventory	Farms	1,355,020		1,346,106		+ 8,914	+ 0.7
	Number(000)	104,408		103,865		+ 534	+ 0.5
Farms by Inventory:							
1 to 19	Farms	495,920		468,692		+ 27,228	+ 5.8
	Number(000)	4,692,278		4,605,211		+ 87,067	+ 1.9
20 to 49	Farms	373,306		392,147		- 18,841	- 4.8
	Number(000)	11,754,241		12,390,851		- 636,610	- 5.1
50 to 99	Farms	242,426		251,684		- 9,258	- 3.7
	Number(000)	16,755,363		17,347,509		- 592,146	- 3.4
100 to 499	Farms	219,986		210,749		+ 9,237	+ 4.4
	Number(000)	40,564,667		38,715,651		+ 1,849,016	+ 4.8
500 or More	Farms	23,382		22,834		+ 548	+ 2.4
	Number(000)	30,641,638		30,805,887		+ 164,249	+ 0.5
Cows and Heifers that had Calved	Farms	1,153,899		1,163,064		- 9,165	- 0.8
	Number(000)	45,034,042		44,547,966		+ 486,076	+ 1.1
Beef Cows	Farms	957,693		954,360		+ 3,333	+ 0.4
	Number(000)	34,182,790		34,326,274		- 143,483	- 0.4
Farms by Inventory:							
1 to 19	Farms	546,968		533,567		+ 13,401	+ 2.5
	Number(000)	4,481,597		4,565,904		- 84,307	- 1.9
20 to 99	Farms	343,896		355,190		- 11,294	- 3.2
	Number(000)	13,791,739		14,207,796		- 418,057	- 2.9
100 to 199	Farms	42,373		41,741		+ 632	+ 1.5
	Number(000)	5,505,481		5,436,445		+ 69,036	+ 1.3
200 or More	Farms	24,456		23,862		+ 594	+ 2.5
	Number(000)	10,403,973		10,116,129		+ 287,844	+ 2.9
Milk Cows	Farms	277,784		312,095		- 34,311	- 10.9
	Number(000)	10,851,252		10,221,692		+ 629,560	+ 6.2

Farms by Inventory:					
1 to 9	Farms	62,692	118,731	- 56,039	- 47.2
	Number(000)	204,432	263,261	- 58,838	- 22.4
10 to 29	Farms	52,646	65,945	- 13,299	- 20.2
	Number(000)	1,030,637	1,287,547	- 256,910	- 20.0
30 to 49	Farms	59,424	63,464	- 4,040	- 6.4
	Number(000)	2,252,405	2,388,981	- 136,576	- 5.7
50 to 99	Farms	53,345	47,704	+ 5,641	+ 11.8
	Number(000)	3,475,222	3,093,370	+ 381,852	+ 12.3
100 or More	Farms	19,677	16,251	+ 3,426	+ 21.1
	Number(000)	3,888,565	3,188,533	+ 700,032	+ 21.9
Heifers and Heifer Calves	Farms	1,073,653	1,060,196	+ 13,457	+ 1.3
	Number(000)	28,665,154	27,800,142	+ 865,012	+ 3.1
Steers, Steer Calves, Bulls, and Bull Calves	Farms	1,150,459	1,134,520	+ 15,939	+ 1.4
	Number(000)	30,708,991	31,517,001	- 808,010	- 2.6
Cattle and Calves Sold	Farms	1,278,628	1,320,163	+ 41,535	+ 3.1
	Number(000)	71,139,881	78,020,351	+6,880,282	+ 8.8
Farms by Number Sold:					
1 to 19	Farms	740,961	717,315	- 23,646	- 3.3
	Number(000)	6,000,563	6,216,857	+ 216,294	+ 3.5
20 to 49	Farms	315,771	352,065	+ 36,294	+ 10.3
	Number(000)	9,589,020	10,744,893	+1,144,873	+ 10.7
50 to 99	Farms	120,354	135,979	+ 16,625	+ 12.1
	Number(000)	8,099,799	9,228,457	+1,125,658	+ 12.2
100 to 499	Farms	87,438	96,820	+ 9,382	+ 9.7
	Number(000)	16,757,029	18,841,963	+2,084,934	+ 11.1
500 or More	Farms	14,104	14,984	+ 880	+ 5.9
	Number(000)	30,693,470	32,999,181	+2,305,711	+ 7.0
Cattle Fattened on Grain and Concentrates Sold	Farms	240,052	247,114	- 7,062	- 2.9
	Number(000)	27,626,763	29,722,043	-2,095,280	- 7.1

TABLE 3

		1982		1978		82/78	82/78
		Number	Percent	Number	Percent	Change	% Change
Dairy Products Sold	Farms	199,612		216,833		- 17,221	- 7.9
	$1,000	16,322,513		11,228,899		+ 5,093,614	+ 45.4
Hogs and Pigs Inventory	Farms	329,862		445,117		- 115,255	- 25.9
	Number(000)	55,623,711		57,697,318		- 2,073,607	- 3.6
Farms by Inventory:							
1 to 99	Farms	211,493		303,253		- 91,760	- 30.3
	Number(000)	5,082,940		7,947,891		- 2,864,951	- 36.1
100 to 499	Farms	89,155		116,640		- 27,485	- 23.6
	Number(000)	20,086,556		24,970,099		- 4,883,543	- 19.6
500 to 999	Farms	19,885		17,890		+ 1,995	+ 11.2
	Number(000)	13,137,256		11,683,066		+ 1,454,190	+ 12.5
1,000 or More	Farms	9,329		7,334		+ 1,995	+ 27.2
	Number(000)	17,316,959		13,096,262		+ 4,220,697	+ 32.2
Hogs and Pigs Used or to be Used for Breeding	Farms	223,695		328,834		- 105,139	- 31.9
	Number(000)	6,952,948		8,516,131		- 1,563,183	- 18.4
Farms by Inventory:							
1 to 9	Farms	91,905		138,681		- 46,776	- 33.7
	Number(000)	382,278		584,373		- 202,095	- 34.6
10 to 24	Farms	57,886		93,908		- 36,022	- 38.4
	Number(000)	885,036		1,431,849		- 546,813	- 38.2
25 to 49	Farms	34,808		50,836		- 16,028	- 31.5
	Number(000)	1,178,280		1,712,107		- 533,827	- 31.2
50 or More	Farms	39,116		45,409		- 6,293	- 13.9
	Number(000)	4,507,354		4,787,802		- 280,448	- 5.9
Hogs and Pigs Sold	Farms	315,119		423,578		+ 108,459	+ 25.6
	Number(000)	94,818,304		90,757,143		- 4,061,161	- 4.5
Farms by Numbers Sold:							
1 to 99	Farms	173,065		237,402		+ 74,337	+ 31.3
	Number(000)	5,145,726		8,033,221		+ 2,887,505	+ 35.9
100 to 499	Farms	100,348		140,658		+ 40,310	+ 28.7
	Number(000)	23,431,908		31,646,338		+ 8,214,430	+ 26.0

500 to 999	Farms	30,042	29,766	- 276	- 0.9
	Number(000)	20,578,235	20,015,261	- 562,974	- 2.8
1,000 or More	Farms	21,664	15,752	- 5,912	- 37.5
	Number(000)	45,662,445	31,062,323	- 14,600,122	- 47.0
Feeder Pigs Sold	Farms	90,377	128,060	- 37,683	- 29.4
	Number(000)	20,044,693	19,491,098	+ 553,595	+ 2.8
Litters of Pigs Farrowed Between: Dec.1 of Preceding Year & Nov.30	Farms	235,191	342,660	- 107,469	- 31.4
	Number(000)	10,360,847	10,999,496	- 638,649	- 5.8
Dec.1 of Preceding Year & May 31	Farms	210,679	301,185	- 90,506	- 30.1
	Number(000)	5,216,245	5,510,114	- 293,869	- 5.3
June 1 & Nov. 30	Farms	198,454	286,642	- 88,188	- 30.8
	Number(000)	5,144,602	5,489,382	- 344,780	- 6.3
Sheeps and Lambs Inventory	Farms	101,576	90,437	+ 11,139	+ 12.3
	Number(000)	12,428,171	12,243,476	+ 184,695	+ 1.5
Ewes 1 Year Old or Older	Farms	90,486	82,287	+ 8,199	+ 9.9
	Number(000)	7,648,594	7,808,221	- 159,627	- 2.0
Sheep and Lambs Sold	Farms	94,954	85,718	+ 9,236	+ 10.8
	Number(000)	10,766,550	10,260,539	+ 506,011	+ 4.9
Sheep and Lambs Shorn	Farms	88,188	80,475	+ 7,643	+ 9.5
	Number(000)	11,248,904	11,354,913	- 106,009	- 0.9
	Wool--Pounds	87,144,505	88,896,358	- 1,751,853	- 2.0
Horses and Ponies Inventory	Farms	417,040	399,335	+ 17,705	+ 4.4
	Number(000)	2,264,629	1,957,028	+ 307,601	+ 15.7
Chickens 3 Months Old or Older Inventory	Farms	215,844	240,891	- 25,047	- 10.4
	Number(000)	362,867	354,357	+ 8,509	+ 2.4

TABLE 3

		1982		1978		82/78	82/78
		Number	Percent	Number	Percent	Change	% Change
Hens and Pullets of Laying Age Inventory	Farms	212,639		237,070		+ 24,431	+ 10.3
	Number(000)	2,264,629		1,957,028		- 307,601	- 15.7
Farms by Inventory:							
1 to 3,199	Farms	203,698		226,398		- 22,700	- 10.0
	Number(000)	9,650,816		13,417,705		- 3,766,889	- 28.1
3,200 to 9,999	Farms	2,693		3,718		- 1,025	- 27.6
	Number(000)	18,530,148		24,699,824		- 6,169,676	- 24.9
10,000 to 19,999	Farms	2,789		3,323		- 534	- 16.1
	Number(000)	37,424,202		44,538,752		- 7,114,550	- 15.9
20,000 or More	Farms	3,459		3,361		- 172	- 4.7
	Number(000)	245,173		217,627		- 27,546	- 12.7
Broilers and Other Meat-Type Chickens Sold	Farms	30,104		31,743		- 1,639	- 5.2
	Number(000)	3,509,893		3,062,154		+ 447,738	+14.6
Turkeys Sold	Farms	7,513		6,033		+ 1,480	+24.5
	Number(000)	171,426		141,276		+ 30,150	+21.3

TABLE 4 CROPS HARVESTED

Corn for Grain or Seed	Farms	715,228	810,577	+ 95,349	+11.8
	Acres(000)	69,867,737	70,043.480	+ 175,743	+ 0.3
	Bushels(000)	7,509,431	6,805,186	- 704,245	-10.3
Farms by Acres Harvested:					
1 to 24 Acres		244,739	294,127	+ 49,388	+16.8
25 to 99 Acres		249,959	289,818	+ 39,859	+13.8
100 to 249 Acres		152,239	164,802	+ 12,563	+ 7.6
250 Acres or More		68,291	61,830	- 6,461	-10.4
Corn for Silage or Green Chop	Farms	222,313	240,561	- 18,248	- 7.6
	Acres(000)	8,018,721	8,271,817	- 253,096	- 3.1
	Green Weight(Tons)	110,728	111,126	+ 398	+ 0.4

Sorghum for Grain or Seed	Farms	93,700	113,336	- 16,750	- 17.4
	Acres(000)	12,678,698	12,899,829	- 292,195	- 3.3
	Bushels(000)	725,981	658,573	+ 67,408	+ 10.2
Wheat for Grain	Farms	446,049	378,574	- 67,475	- 17.8
	Acres(000)	70,889,930	54,155,168	- 16,734,762	- 30.1
	Bushels(000)	2,372,551	1,607,540	- 765,010	- 47.6
Farms by Acres Harvested:					
1 to 24 Acres		128,047	125,760	- 2,287	- 1.8
25 to 99 Acres		152,067	121,414	- 30,653	- 25.2
100 to 249		84,269	67,956	- 17,313	- 25.5
250 Acres or More		80,666	63,444	- 17,222	- 27.1
Barley for Grain	Farms	79,310	96,060	- 16,750	- 17.4
	Acres(000)	8,651,617	8,943,812	- 292,195	- 3.3
	Bushels(000)	468,383	427,559	+ 40,825	+ 9.5
Oats for Grain	Farms	280,888	319,744	- 38,856	- 12.2
	Acres(000)	9,131,093	10,121,903	- 990,810	- 9.8
	Bushels(000)	505,784	513,485	- 7,702	- 1.5
Cotton	Farms	38,268	52,628	- 14,360	- 27.3
	Acres(000)	9,781,905	12,693,772	- 2,911,867	- 22.9
	Bales(000)	11,375,790	10,686,447	+ 689,323	+ 6.5
Farms by Acres Harvested:					
1 to 24 Acres		5,098	7,978	- 2,880	- 36.1
25 to 99 Acres		11,164	15,504	- 4,430	- 27.9
100 to 99 Acres		10,138	13,655	- 3,517	- 25.7
250 Acres or More		11,868	15,491	- 3,623	- 23.4
Tobacco	Farms	179,285	188,649	- 9,364	- 5.0
	Acres(000)	934,380	963,224	- 28,844	- 3.0
	Pounds	1,877,557	1,918,190	- 40,632	- 2.1
Soybeans for Beans	Farms	511,247	537,037	+ 25,790	+ 4.8

TABLE 4

		1982		1978		82/78	82/78
		Number	Percent	Number	Percent	Change	% Change
Soybeans for Beans	Acres(000)	64,830,833		61,339,849		- 3,490,984	- 5.7
	Bushels(000)	1,969,931		1,722,154		- 247,777	- 14.4
Farms by Acres Harvested:							
1 to 24 Acres		108,348		126,345		+ 17,997	+ 14.2
25 to 99 Acres		208,093		226,822		+ 18,729	+ 8.3
100 to 249 Acres		129,175		126,598		- 2,577	- 2.0
250 Acres or More		65,631		57,272		- 8,359	- 14.6
Irish Potatoes	Farms	27,025		26,421		+ 604	+ 2.3
	Acres(000)	1,269,268		1,385,886		- 116,618	- 8.4
	Cwt(000)	334,857		351,217		- 16,360	- 1.9
Hay-Alfalfa, Other Tame, Small Grain, Wild, Grass Silage, Green Chop, etc.	Farms	1,051,055		1,132,997		- 81,942	- 7.2
	Acres(000)	56,750,845		60,241,391		- 3,490,546	- 5.8
Alfalfa Hay	Farms	508,303		557,585		- 49,282	- 8.8
	Acres(000)	23,911,551		25,960,083		- 2,048,532	- 7.9
	Dry Weight(tons)	71,675,213		75,008,845		- 3,333,632	- 4.4
Vegetables Harvested for Sale	Farms	69,157		73,183		- 4,026	- 5.5
	Acres(000)	3,337,095		3,534,142		- 197,047	- 5.6
Farms by Acres Harvested:							
0.1 to 4.9 Acres		29,553		29,777		- 224	- 0.8
5.0 to 24.9 Acres		19,957		21,893		- 1,936	- 8.8
25.0 to 99.9 Acres		13,219		14,885		- 1,666	- 11.2
100.0 Acres or More		6,428		6,628		- 200	- 3.0
Land in Orchards	Farms	123,707		121,852		+ 1,855	+ 1.5
	Acres(000)	4,752,968		4,463,627		+ 289,341	+ 6.5
Farms by Acres Harvested:							
0.1 to 4.9 Acres		48,504		44,881		+ 3,623	+ 8.1
5.0 to 24.9 Acres		44,422		45,743		- 1,321	- 2.9
25.0 to 99.9 Acres		21,870		22,940		- 1,070	- 4.7
100.0 Acres or More		8,911		8,288		+ 623	+ 7.5

Nursery and Greenhouse Products, Mushrooms, and Sod Grown for Sale	Farms	35,514		34,650		+	864	+	2.5
	Sq. Ft.(000)	642,304		564,543		+	7,776,137	+	13.8
	Acres(000)	452,297		404,404		+	47,893	+	11.8
	$1,000	3,823,663		2,835,732		+	987,931	+	34.8

TABLE 5 FARMS WITH SALES OF $10,000 OR MORE

Farms	Number(000)	1,143,253	51.0	1,180,151	52.3	-	36,898	-	3.1
Land in Farms	Acres(000)	809,505	82.2	829,229	81.4	-	19,723	-	2.4
Average Size of Farm	Acres(000)	708		703		+	5	+	0.7
Value of Land and Buildings:									
Average per Farm	Dollars	560,808		440,971		+	119,837	+	27.2
Average per Acre	Dollars	791		628		+	163	+	26.0
Farms by Size:									
1 to 9 Acres		40,604	1.8	35,631	1.6	+	4,973	+	14.0
10 to 49 Acres		76,295	3.4	69,133	3.1	+	7,162	+	10.4
50 to 179 Acres		287,327	12.8	293,302	13.0	-	5,975	-	2.0
180 to 499 Acres		401,872	17.9	438,872	19.4	-	37,000	-	8.4
500 to 999 Acres		184,863	8.3	191,483	8.5	-	6,620	-	3.5
1,000 to 1,999 Acres		91,698	4.1	91,731	4.1	-	33	-	0.04
2,000 Acres or More		61,175	2.7	59,999	2.7	+	1,176	+	2.0
Land in Farms According to Use:									
Total Cropland	Farms	1,083,774		1,125,698		-	41,924	-	3.7
	Acres(000)	396,298		394,833		+	1,464	+	0.4
Harvested Cropland	Farms	1,051,626		1,091,464		-	39,838	-	3.6
	Acres(000)	306,245		292,173		+	14,072	+	4.8
Irrigated Land	Farms	183,472		190,147		-	6.675	-	3.5

TABLE 5

		1982		1978		82/78	82/78
		Number	Percent	Number	Percent	Change	% Change
Selected Farm Production Expenses:							
Commercial Fertilizer	$1,000	7,320,440		5,909,619		+ 1,410,821	+ 23.9
Other Agricultural Chemicals	$1,000	4,155,709		2,738,024		+ 1,417,685	+ 51.8
Hired Farm Labor	$1,000	8,147,471		6,541,391		+ 1,606,080	+ 24.6
Energy and Petroleum Products	$1,000	9,286,101		5,475,402		+ 3,810,699	+ 69.6
Interest Expense	$1,000	10,952,360		(NA)			
Cattle and Calves Inventory	Farms	675,671		711,436		- 35,765	- 5.0
	Number(000)	89,058,785		89,260,678		- 201,893	- 0.2
Beef Cows	Farms	416,162		442,990		- 26,828	- 6.1
	Number(000)	26,591,377		26,948,942		- 357,565	- 1.3
Milk Cows	Farms	212,215		229,473		- 17,258	- 7.5
	Number(000)	10,634,955		9,922,646		- 712,309	- 7.2
Hogs and Pigs Inventory	Farms	219,155		283,535		- 64,380	- 22.7
	Number(000)	53,696,097		54,115,219		- 419,122	- 0.8
Chicken 3 Months Old or Older Inventory	Farms	77,524		99,012		- 21,497	- 21.7
	Number(000)	357,803		348,295		+ 9,507	+ 2.7
Corn for Grain or Seed	Farms	546,648		587,183		- 40,535	- 6.9
	Acres(000)	62,273,380		66,542,688		+ 1,070,103	+ 1.6
	Bushels(000)	7,342,017		6,573,923		+ 768,094	+11.7
Wheat for Grain	Farms	367,256		302,679		+ 64,577	+21.3
	Acres(000)	68,457,908		51,202,136		+17,255,772	+33.7
	Bushels(000)	2,313,661		1,541,197		772,464	+50.1
Cotton	Farms	33,188		43,937		- 10,749	-24.5
	Acres(000)	9,608,299		12,417,308		- 2,809,009	-22.6
	Bales(000)	11,259,932		10,544,540		+ 715,392	+ 6.8

Tenure of Operator:							
Full Owners		482,201	21.5	485,164	21.5	- 2,963	- 0.6
Part Owners		490,983	21.9	514,399	22.8	- 23,416	- 4.6
Tenants		170,069	7.6	180,588	8.0	- 10,519	- 5.8
Operators by Principal Occupation:							
Farming		901,504	40.2	934,066	41.4	- 32,562	- 3.5
Other than Farming		241,749	10.8	246,085	10.9	- 4,336	- 1.8
Estimated Market Value of all Machinery and Equipment	$1,000	79,469,277		66,003,646		+ 13,465,631	+ 20.4
Average per Farm	Dollars	69,640		55,694		+ 13,946	+ 25.0
Market Value of Agricultural Products Sold	$1 Million	127,960		102,928		+ 25,032	+ 24.3
Average per Farm	Dollars	111,926		87,216		+ 24,710	+ 28.3
Crops, including nursery and Greenhouse Products	$1,000	60,658,213		46,375,510		+14,282,703	+ 30.8
Livestock, Poultry, and their Products	$1,000	67,301,435		56,552,071		+10,749,364	+ 19.0
Poultry and Poultry Products	$1,000	9,701,956		8,430,754		+ 1,271,202	+ 15.1
Dairy Products	$1,000	16,237,251		11,127,307		+ 5,109,944	+ 45.9
Selected Farm Production Expenses:							
Livestock and Poultry Purchased	$1,000	16,554,334		15,576,421		+ 977,913	+ 6.3
Feed for Livestock and Poultry	$1,000	17,883,345		15,144,923		+ 2,738,422	+ 18.1
Seeds, Bulbs, Plants, and Trees	$1,000	3,049,607		2,470,186		+ 579,421	+ 23.5

Farms by Size:							
500 to 999 Acres		19,073	0.9	21,726	1.0	- 2,653	- 12.2
1000 to 1999 Acres		5,698	0.3	6,069	0.3	- 371	- 6.1
2,000 Acres or More		3,350	0.1	3,302	0.1	+ 48	+ 1.5
Land in Farms According to Use:							
Total Cropland	Farms	927,005		955,906		- 28,901	- 3.0
	Acres(000)	49,230		59,041		- 9,811	- 16.6
Harvested Cropland	Farms	758,275		813,138		- 54,863	- 6.7
	Acres(000)	20,067		24,973		- 4,906	- 19.6
Irrigated Land	Farms	94,896		90,632		+ 4,264	+ 4.7
	Acres(000)	2,145,419		2,565,885		- 420,466	- 16.4
Tenure of Operator:							
Full Owners		843,730	37.7	812,738	36.0	+ 30,992	+ 3.8
Part Owners		165,236	7.4	166,713	7.4	- 1,477	- 0.9
Tenants		88,905	4.0	98,173	4.3	- 9,268	- 9.4
Operators by Principal Occupation:							
Farming		333,354	14.9	335,239	14.8	- 1,885	- 0.6
Other than Farming		764,517	34.1	742,385	32.9	+ 22,132	+ 3.0
Estimated Market Value of all Machinery and Equipment	$1,000	14,217,031		11,597,043		+ 2,619,988	+ 22.6
Market Value of Agricultural Products Sold	$1 Million	3,851		4,146		- 295	- 7.1
Crops, including Nursery and Greenhouse Products	$1,000	1,616,181		1,827,690		- 211,509	- 11.6

TABLE 5

		1982		1978		82/78	82/78
		Number	Percent	Number	Percent	Change	% Change
Tobacco	Farms	87,626		86,279		+ 1,347	+ 1.6
	Acres(000)	794,636		805,723		- 11,087	- 1.4
	Pounds(000)	1,641,618		1,647,868		- 6,250	- 0.4
Soybeans for Beans	Farms	410,460		413,082		- 2,622	- 0.6
	Acres(000)	62,273,380		58,047,445		+ 4,225,935	+ 7.3
	Bushels(000)	1,931,321		1,653,376		+ 277,945	+ 16.8
Irish Potatoes	Farms	13,896		14,559		- 663	- 4.6
	Acres(000)	1,253,254		1,368,354		- 115,100	- 8.4
	Cwt(000)	332,476		349,017		- 16,541	- 4.7
Hay-Alfalfa, Other Tame, Small Grain, Wild, Grass Silage, Green Chop, etc.	Farms	593,688		645,284		- 51,596	- 7.9
	Acres(000)	46,429,647		48,780,891		- 2,351,244	- 4.8
Vegetables Harvested for Sale	Farms	40,092		41,659		- 1,567	- 3.8
	Acres(000)	3,208,983		3,363,252		- 154,269	- 4.6
Land in Orchards	Farms	51,469		53,386		- 1,917	- 3.6
	Acres(000)	4,148,195		3,908,105		+ 240,090	+ 6.1

TABLE 6 FARMS WITH SALES UNDER $10,000

Farms	Number(000)	1,097,871	49.0	1,077,624	47.7	+ 20,247	+ 1.9
Land in Farms	Acres(000)	155,250	16.1	185,548	18.3	- 30,298	- 16.3
Average Size of Farm	Acres(000)	141		171		- 31	- 18.0
Farms by Size:							
1 to 9 Acres		147,095	6.6	115,602	5.1	+ 31,493	+ 27.2
10 to 49 Acres		373,006	16.6	322,421	14.3	+ 50,585	+ 15.7
50 to 179 Acres		424,374	18.9	465,747	20.6	- 41,371	- 8.9
180 to 499 Acres		125,275	5.6	142,759	6.3	- 17,484	- 12.2

TABLE 6		1982 Number	1982 Percent	1978 Number	1978 Percent	82/78 Change	82/78 % Change
Livestock, Poultry, and Their Products	$1,000	2,235,074		2,318,187		- 83,113	- 3.6
Poultry and Poultry Products	$1,000	30,266		32,732		- 2,466	- 7.5
Dairy Products	$1,000	85,262		101,592		- 16,330	- 16.1
Selected Farm Production Expenses:							
Livestock and Poultry Purchased	$1,000	556,565		462,823		+ 93,742	+ 20.3
Feed for Livestock and Poultry	$1,000	690,376		641,072		+ 49,304	+ 7.7
Seeds, Bulbs, Plants, and Trees	$1,000	124,147		136,932		- 12,785	- 9.3
Commercial Fertilizer	$1,000	369,137		420,962		- 51,825	- 12.3
Other Agricultural Chemicals	$1,000	127,086		151,479		- 24,393	- 16.1
Hired Farm Labor	$1,000	286,928		273,037		+ 13,891	+ 5.1
Energy and Petroleum Products	$1,000	687,562		550,302		+ 137,260	+ 24.9
Interest Expense	$1,000	721,535		(NA)			
Cattle and Calves Inventory	Farms	679,349		634,670		+ 44,679	+ 7.0
	Number(000)	15,350		14,605		+ 745	+ 5.1
Beef Cows	Farms	541,531		511,370		+ 30,161	+ 5.9
	Number(000)	7,591,413		7,377,332		+ 214,081	+ 2.9
Milk Cows	Farms	65,569		82,622		- 17,053	- 20.6
	Number(000)	216,297		229,046		- 82,749	- 36.1
Hogs and Pigs Inventory	Farms	110,707		161,582		- 50,875	- 31.5
	Number(000)	1,927,614		3,582,099		- 1,654,485	- 46.2
Chickens 3 Months Old or Older Inventory	Farms	138,320		141,870		- 3,550	- 2.5

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Corn for Grain or Seed	Farms	168,580	223,394	-	54,814	-	24.5
	Acres(000)	2,254,946	3,500,792	-	1,245,846	-	35.6
	Bushels(000)	167,414	231,262	-	63,848	-	27.6
Wheat for Grain	Farms	78,793	75,895	+	2,898	+	3.8
	Acres(000)	2,432,022	2,953,032	-	521,010	-	17.6
	Bushels(000)	58,890	66,343	-	7,453	-	11.2
Cotton	Farms	5,080	8,691	-	3,611	-	41.6
	Acres(000)	173,606	276,464	-	102,858	-	37.2
	Bales(000)	115,838	141,907	-	26,069	-	18.4
Tobacco	Farms	91,659	102,370	-	10,711	-	10.5
	Acres(000)	139,744	157,501	-	17,757	-	11.3
	Pounds(000)	235,939	270,321	-	34,382	-	12.7
Soybeans for Beans	Farms	100,787	123,955	-	23,168	-	18.7
	Acres(000)	2,557,453	3,292,404	-	734,951	-	22.3
	Bushels(000)	58,610	68,778	-	10,168	-	14.8
Irish Potatoes	Farms	13,129	11,862	+	1,267	+	10.7
	Acres(000)	16,014	17,532	-	1,518	-	8.7
	Cwt(000)	2,381	2,200	+	181	+	8.2
Hay-Alfalfa, Other Tame, Small Grain, Wild, Grass Silage, Green Chop, etc.	Farms	457,367	487,713	-	30,346	-	6.2
	Acres(000)	10,321,198	11,460,500	-	1,139,302	-	9.9
Vegetables Harvested for Sale	Farms	29,065	31,524	-	2,459	-	7.8
	Acres(000)	128,112	170,890	-	42,778	-	25.0
Land in Orchards	Farms	72,238	68,466	+	3,772	+	5.5
	Acres(000)	604,773	555,522	+	49,251	+	8.9